Building a National Emergency Tele-Critical Care Network (NETCCN)

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Disclosures

The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Department of the Army or the Department of Defense.

I have no financial disclosures.

Do not be constrained by your present reality. - Leonardo DaVinci
The Telemedicine and Advanced Technology Research Center

We explore, innovate, automate and deliver advanced medical technologies that enhance military health care.

Mission:
To forge the future by fusing data, humans, and machines into solutions that optimize warfighter performance and casualty care.

Artificial Intelligence and Machine Learning at the Biotechnology High Performance Computing Software Applications Institute (BHSAI)

The Medical Robotics and Autonomous Systems Innovation Center

The Digital Health Innovation Center

The Medical Modeling, Simulation, and Visualizations Innovation Center
Technology in Disaster Environments

Focus: National Emergency Tele-Critical Care Network, a Federal-Civilian Partnership

"Forging the future by fusing data, humans, and machines into solutions that optimize warfighter performance and casualty care."
A BIG Problem: Where there are no ICU beds, there are no critical care trained clinicians!

- Disasters Stress Healthcare System infrastructure, resources, and staff
- The NETCCN helps solve important problems for COVID-19 and represents an important component of a next generation NDMS
- The project has received funding from ASPR to scale, optimize, and sustain the initial prototype(s) being developed with DoD funding.
“Recently, the Society of Critical Care Medicine (SCCM) Tele-ICU Committee has recommended that the traditional term tele-ICU be updated to tele-critical care (TCC), defined as critical care services delivered using communications technologies from anywhere to anywhere. This term better represents the profession today and how it will carry into the future.”

Lana A. Adzhigirey, RN, MN, CPHQ; Jayashree Raikhelkar, MD; Ralph J. Panos, MD; Jeremy C. Pamplin, MD, FCCM, FACP; Konrad L. Davis, MD, FCCM, FCCP; Fiona A. Winterbottom DNP, MSN, APRN, ACNS-BC, ACHPN, CCRN; Majdi Hamarshi, MD; Christopher Palmer, MD, FACEP; Marilyn Hravnak, RN, PhD, ACNP-BC, FCCM, FAAN, “Building a Case for Tele-Critical Care to Improve Quality”, Critical Connections, 2019

https://www.sccm.org/Communications/Critical-Connections/Archives/2019/Building-a-Case-for-Tele-Critical-Care-to-Improve
What is NETCCN?

Anywhere to anywhere tele-critical care support services for disaster environments

Solution set that provides specific mobile interfaces for patients, local caregivers and remote experts

Solution sets will be independent/agnostic from a specific electronic health record or proprietary systems

Delivering tele-critical care to Guam, Puerto Rico, Minnesota, North and South Dakota – at hospital, at home

Funded by US Army MRDC & and HHS ASPR
The minimum capabilities of this system include:

1. Secure, mobile communications capabilities, including synchronous audio/video and asynchronous messaging
2. Capability for basic documentation in real-time as well as data collection and reporting.
3. A patient registration and cohorting system
4. A team organization and management tool including handoff features for change of shifts and transfers of care
5. Cloud-based information storage including ability for later offloading to EHRs, HIEs and other systems
6. HIPAA Compliant
7. Survey and Consent tools
8. A well-described clinical and staffing model that incorporates the technology in a simple, reliable manner for scaling during a disaster.
# NETCCN vs. “Normal” Tele-Critical Care

## NETCCN
- Temporary (disaster care)
- Immediately available
- Minimum Viable Capabilities
- Stand-alone w/offload
- Designed for 4G+
- No additional hardware
- Distance clinicians anywhere
- Delivery to anywhere
- Interoperable across vendors
- Secure

## “Normal” TCC
- Permanent
- Planned roll-out over months
- Feature Rich
- Tightly integrated w/Enterprise
- Designed for broadband
- Additional hardware necessary
- Distance clinicians at “hub”
- Delivery to defined spokes
- Single vendor platform
- Secure
**PROBLEM:** Not Enough Qualified Clinicians To Provide Care In A Global Emergency

**Phase 1**
Continue to iterate, improve & scale 2-3 Best Minimum Viable TCC Platforms w/Testing & Simulation

**Phase 2**

- Add increased hospital like capabilities at the point of need (“Virtual Hospital”)
  - Interoperability
  - Remote control/Automating tasks
  - Resources and Supply

- Add Predictive analytics/Artificial Intelligence

- Add data feeds to Multi-Platform Dashboard Operating System (DoS) to Enable Cross-System Situational Awareness

Build and connect data commons to power AI & Dashboard Operating System
TiDE enables critical care anywhere
NETCCN Project – Competitive Down Selection

9 Offeror teams selected for Task 1
6 Offeror teams selected for Task 2
4 Offeror team have been selected for Task 3.
Another down-selection is possible prior to Task 4.
Task 4/5 – the intent is to explore options for increased collaboration from the best of breed offeror solution sets
TATRC has awarded the following four teams for Phase 3 of the NETCCN project:

» **Avera Health** with VitelNet and DocBox

» **Deloitte Consulting, LLP** with AWS GovCloud, Decisio Health, Elsevier, Qventus, T6 Health System, Verizon, Zyte

» **Expressions Network, LLC** with Mercy ACO Clinical Services, Active Innovations, and SDSE Networks

» **The Geneva Foundation** with Omnicure, Society of Critical Care Medicine (SCCM) Discovery Network, DocBox, MD PnP Program at Massachusetts General Hospital, and Madigan Army Medical Center (MAMC)/Telemedical Research for Operational Support (TR4OS)
Early NETCCN Successes

Rapid deployment, adoption and use
- Ready in hours – no HW, integration
- Clinicians & patients adoption in days
- Thousands of live video, messages, files

Fills in clinical gaps in surges
- Pneumothorax ID & treated w/out local MD
- Nights and weekends to reduce burn-out

Home-based monitoring
- Currently monitoring over 200 patients

Available when other systems fail
- Served as continuity when network & other systems failed

Locations without ICU beds do not have clinicians who know how to use ventilators – even if they become available. Necessary is a simple, consistent means to reliably and effectively support people who deliver critical care. As long as network resources are available, Tele-Critical Care is a solution*.

* Barbashian et al. NEJM Catalyst (2020).

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Examples of how NETCCN clinicians have helped hospitals and local care teams

» Back-up support for fixed Tele-Services
» Relieving anxiety
» Relieving task saturation
» A second set of eyes
» A second set of “brains”
» Remote Home Monitoring and Hospital at Home Services
» Palliative care
» Opportunity
FOCUS AREA #1: Accelerating Medical Device Interoperability and Autonomy (MDIA)

Accelerating mechanical ventilator and/or infusion pump interoperability, remote control and integration into NETCCN (National Emergency Tele-Critical Care Network) platforms in support of tele-critical care of COVID-19 patients.

FOCUS AREA #2: Technology in Disaster Environments (TiDE) Learning Accelerator (TLA)

Developing performance measures and accelerating the availability and application of insight for use in improving delivery of tele-critical care through NETCCN and to technology in civilian and military disaster and mass casualty environments more broadly.

https://www.mtec-sc.org/upcoming-solicitations/
How do we develop the medical intelligent system that synchronizes all the technologies into ONE cohesive stack (the system-of-systems)?

UNCLASSIFIED
To define terms and conditions between the Parties in order to establish clear expectations about each party’s roles and responsibilities for:

1) the operational execution and transition of the NETCCN project from TATRC to ASPR,
2) developing a framework for sustainment and integration of NETCCN into ASPR’s operational response capabilities and structure, and
3) creating a collaborative partnership between the Parties for studying and improving the impact of digital health applications to support disaster healthcare.

EFFECTIVE PERIOD. This MOA is effective on 09/29/2020 and expires on 09/29/2024.

Initial IAA of $40M from ASPR to TATRC
The Upcoming COVID Tsunami

» Record hospitalizations

» Record number of clinicians, especially critical care, in quarantine for 7-14 days

» Clinician burn-out and overwork

» Traveling clinicians avoiding hot spots

» National level emergency (vs. local or regional)
Challenges for COVID Surge

» How to scale capacity & support NOW?!

» Expand clinical capacity
  » Volunteers
  » COVID Quarantine Force

» Expand service delivery sites
  » Awareness
  » Onboarding process / site

» Operationalize R&D project

» Not losing R&D & Learning
Clinicians who are in quarantine (7-14 days) deliver care through NETCCN platforms to COVID hot spots
- Critical care MDs & RNs
- Respiratory Therapists
- Others for Home-based care / monitoring

Health systems use NETCCN and quarantining staff to:
- Support their own COVID surge needs and/or;
- National COVID surge needs

Health system POC works directly with NETCCN team(s) to identify, onboard (download, train, insure, credential, as applicable) and off-board Quarantine Force staff
NETCCN enables incorporation of short-term, at-home clinicians to begin contributing in 1-2 days because:

- No additional hardware to deliver care (download an “app”)
- Minimal training and onboarding to use basic capabilities
- Governance issues handled by NETCCN team
How does it work?

» Identify interested Health System(s)
  » NETCCN for their own use; and/or
  » NETCCN for National support;

» Identify Health System POC to act as coordinator
  » Identify available clinicians & provide basic information per form

» Connect Health System POC with NETCCN team lead to:
  » Receive list of available clinicians
  » Onboard, train, insure and credential (as appropriate) clinicians
  » Complete applicable surveys

» Begin delivery of care
What NETCCN Support Requires

» Waiver of state licensure requirements (i.e. cross state licensure for telemedicine) by law or executive order

» A local clinical, IT, and administrative champion willing and available to help solve problems together with the NETCCN partner

» These individuals must complete demographic information survey information for the hospital and be able to define/negotiate requested services

» Rapid disaster privileging for NETCCN remote experts (doctors, nurses, respiratory therapists, as needed)

» Availability of personal or facility purchased mobile devices (cell phones or tablets); in some cases, a web interface can be used on a laptop or desktop computer
What NETCCN does not need

» Access to the local hospital network
» Installation of any hardware or wiring
» Insurance coverage
» Payment for disaster services (sustainment of service beyond government dictated time periods is not permitted unless it is purchased by the local hospital)
Conclusion

» NETCCN is currently supporting care for COVID patients across the country

» The COVID Tsunami is coming (and already here).

» To make a difference, we need to rapidly scale:
   » Clinical capacity
   » NETCCN Care delivery locations

» NETCCN Quarantine Force is a means to leverage the thousands of clinicians in quarantine in the fight against COVID
How to Proceed

» Please contact TATRC if you’re interested in learning more about:

A) Contributing clinicians as part of the Quarantine Force
   - For your own health system
   - For others
   - Both

B) Support from NETCCN

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Thank you and happy to answer any questions!

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