

Current State of Telecritical Care in the United States

A summary, with examples, of the currently deployed Telecritical Care implementations systems and care models across the United States supplemented by current technical considerations, and barriers preventing mainstream adoptions. Brought to you by the USAMRDC Telemedicine and Advanced Technology Research Center.

Telecritical Care in the United States

Telecritical Care Systems: Many large health systems in the United States have invested in TCC implementations. According to a 2017 survey by the Society of Critical Care Medicine, 35% of respondents reported that their centers had access to a formal TCC program, and 65% had access to an informal TCC service. Health systems with existing telecritical care programs adapted their programs for COVID not by trying to replicate and scale the highest technology capabilities (e.g. e-ICU monitoring with interfaces to medical devices) but by beginning with the addition of lighter-weight technologies that they could rapidly deploy (referred to as "the light infantry approach").

Larger TCC programs

- Banner Health
- Mercy Health
- Intermountain Health
- Avera
- Baptist Health
- Veterans Administration

Primary Models: Three have been developed specially for TCC.

- Hub and Spoke: utilizing a fully featured central command center that has access to real-time monitoring with outreach to smaller outlying hospitals, often with a camera in every room and full access to the local electronic medical record
 - Pros: can provide nearly complete ICU care with the exception of emergency procedures
 - Cons: expensive, requires significant infrastructure costs, higher level of training and maintenance, requires a significant patient volume to justify cost
- Distributed Consultation Model: generally based on lighter technical implementation and focused on consultation rather than continuous monitoring
 - Pros: rapidly deployable and lower startup costs, appealing to low critical illness volume area (i.e. rural)
 - Cons: less fully featured, less ability to apply predictive analytics to prevent clinical deteriorations
- Hybrid Models: offer hub with some spokes combined with scaled down instances in some low volume areas

Technical Considerations: the technology required for telemedicine is already in use including:

- Mobile communications capabilities including synchronous audio/video, asynchronous messaging, and access to continuous monitoring
- Clinician-facing web portals and/or phone or tablet-based applications
- Capability for basic documentation in real time as well as data collection and reporting
- Cloud-based information storage including ability for later offloading via PDF or HL7

Policy, Legal, and Interoperability: barriers have limited expansion of existing programs in several ways:

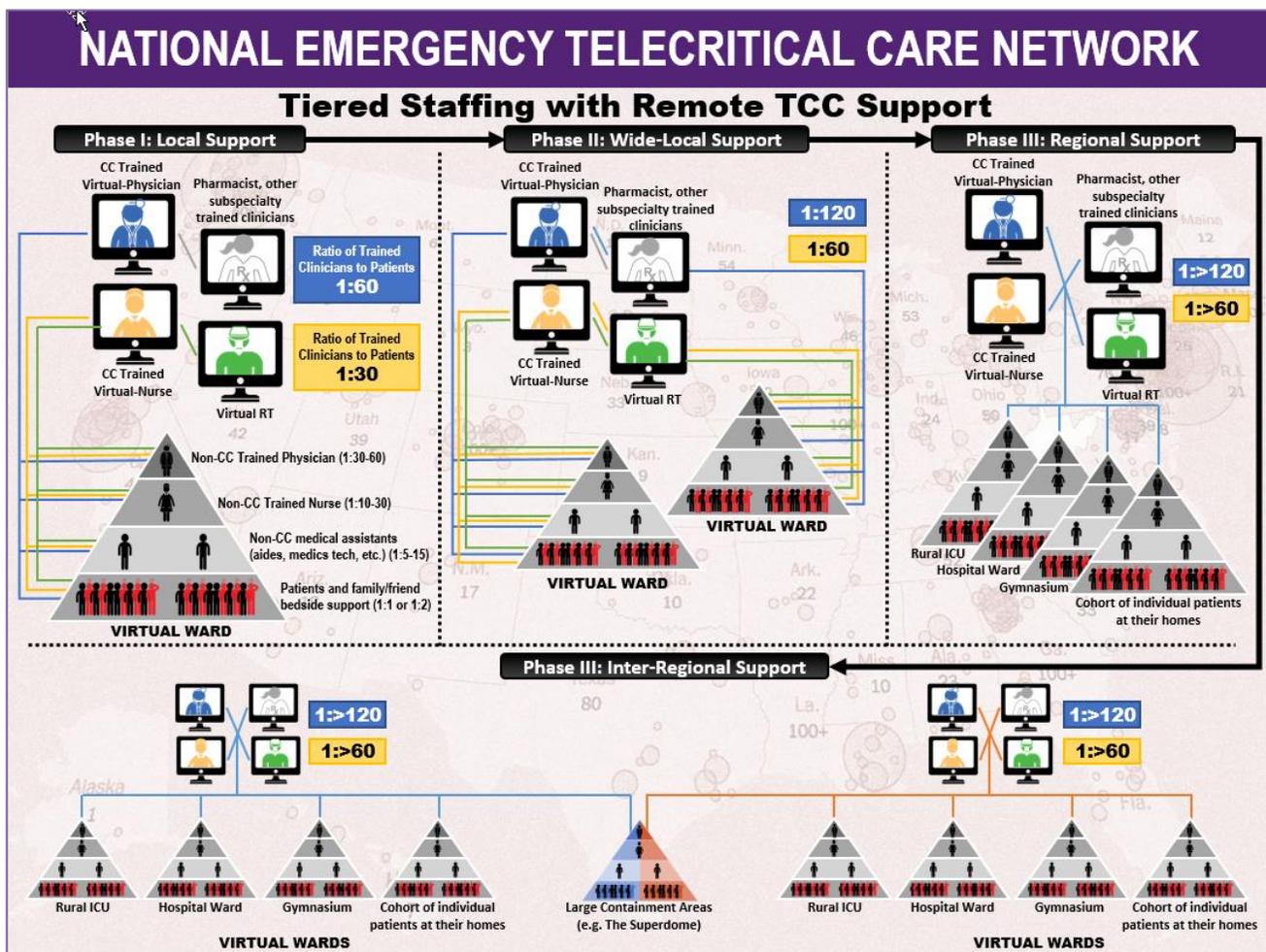
- Legal, regulatory, and administrative barriers to licensing and credentialing make practice across state lines, institutions, and provider systems difficult
- There is essentially no coordination between centers that can be leveraged in the setting of national crisis
- Critical care services provided remotely have generally not been billable. There is currently work in progress to establish CPT codes for this service but this will not be formalized until late 2020.
- The scattered implementation of multiple commercial systems and providers has led to fragmentation and little focus on interoperability between medical record systems, technical platforms, and provider groups.

Information here compiled from:

Subramanian S, Pamplin JC, Hravnak M, Hielsberg C, Riker R, Rincon F, Laudanski K, Adzhigirey LA, Moughrabieh MA, Winterbottom FA, Herasevich V. (2019, Dec 17). *Tele-Critical Care: An Update From the Society of Critical Care Medicine Tele-ICU Committee*. <https://journals.lww.com/ccmjournal>

The Need for a National Emergency Telecritical Care Network

Although the United States has more critical care beds per capita than other developed nations, emerging national and international experience with COVID-19 related critical illness suggests a high level of oncoming system stress on critical care resources and a rapid potential for ICU beds and care teams to be overwhelmed. Telecritical care can be a powerful force-multiplier in the extension of limited critical care resources in both high-census urban centers and rural communities in which access to critical care is limited even under normal conditions. Many local and regional health systems have invested extensively in telemedicine capability, but many of these systems are siloed, have limited capability for external communication or coordination, and are not rapidly scalable. To solve this a NETCCN (National Emergency Telecritical Care Network) comprised of a cloud-based, low-resource, stand-alone health information management system for the creation and coordination of flexible and extendable “virtual critical care wards” must be developed and deployed. These wards would bring high-quality critical care capability to nearly every bedside, be it healthcare facility, field hospital, or gymnasium. The key attribute of a NETCCN architecture will not only be the ability to provide virtual surge support forward to the point of need, but the ability to collect and curate from across this digital ecosystem. The capacity to aggregate and visualize patient data will not only improve medical decision making at the bedside, but will also drive patient care algorithms, and support leadership pop-health decision making.



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