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Emergency Medicine Telehealth for COVID-19: Minimize Front-Line Provider Exposure and Conserve Personal Protective Equipment



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Novel coronavirus disease 2019 (COVID-19) continues to spread across the globe.^{1,2} Hospitals in densely populated urban locales of the United States are overwhelmed with new cases that exceed their ability to provide safe efficient care to everyone while simultaneously conserving personal protective equipment (PPE) for their workforce.³⁻⁷ Our colleagues and friends on the frontlines of the COVID-19 fight are sharing lessons with others as we prepare for the continued viral spread.^{4,8-12} Hospitals across the nation have scrambled emergency preparedness and incident command teams to redistribute limited resources, retool workflows, and develop safe care practices for patients, families, and health care teams.

Telehealth activities and tools are being rapidly deployed across the nation to help limit disease spread, reduce health care workforce (HCW) exposure, and conserve valuable PPE.¹³⁻²¹ Telehealth is a more broadly encompassing term for all digital activities used for health care, whereas telemedicine can be loosely defined as direct virtual medical care from a health care professional to the patient. It is important to make the distinction between both synchronous and asynchronous telehealth activities; the former occurring in real time.

In response to the pandemic and national emergency declaration, the federal government has eased restrictions on what were once significant administrative, regulatory, and legislative barriers to telehealth deployment: state licensure, hospital privileging

and credentialing, range of providers, types of services and originating sites, government and commercial health insurance reimbursement, parity with regular in-person visits, and allowable digital technologies. This has opened a time-sensitive opportunity for novel, digital approaches to acute emergency and intensive patient care that should reduce health care risk by mitigating exposure and save highly valuable PPE. Further, the accelerated adoption of existing digital tools by health consumers, payers, and providers, coupled with analytics, will help drive future health care strategic planning.

Mayo Clinic contracts with InTouch Health for both software and hardware solutions for synchronous acute care telehealth programs. However, there are a myriad of hardware and software solutions that exist that could be set up in a relatively short time frame in health care organizations that currently do not use telehealth (ie, Zoom, San Jose, CA).

The future of telehealth and health care will be debated following this crisis. We predict a profound change to current state health care operations. Our purpose is to outline current Mayo Clinic strategies harnessing telehealth solutions for COVID-19 emergency preparedness and acute emergency care.

EMERGENCY MEDICINE TELEHEALTH (SYNCHRONOUS /ASYNCHRONOUS)

The Mayo Clinic Emergency Medicine Telehealth (TeleEM) program is an ongoing network serving rural emergency

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departments across our large Midwest practice, using both synchronous video and telephonic tools for complex or critically ill patients. However, given the current crisis, the Department of Emergency Medicine has expanded this role internally by adopting telehealth to support its own academic campus.

What makes Mayo Clinic unique is our large integrated multispecialty practice and our multidisciplinary approach to patient care. Telehealth can amplify that work via the InTouch Health software platform via a feature called “multi-presence” allowing for multiple participants to engage a patient simultaneously (Figure). After a primary synchronous video connection is established, other teams can join the video session as “guests” allowing for the multidisciplinary team approach to complex, high-acuity critical care. Currently, the TeleEM team can bring in cardiology, critical care, neurologic critical care, pediatric intensive care, TeleStroke, TeleNeonatology, TeleObstetrics, as well as EM TelePharmacy.

Primary benefits to using telehealth internally and mission aims are to conserve PPE and reduce the HCW exposure when safely possible. Telehealth opens the door to new models of acute emergency care. Multiple workflows were identified as amendable to augmentation with telehealth technology.

First, a variation in the provider-in-triage model: hemodynamically stable patients arriving to the emergency department (ED) suspect for COVID-19 without respiratory distress and mild symptoms do not require a full ED exam room. It is unlikely they require hospitalization but may require COVID-19 testing and may be seen by a TeleEM physician via video. Following an appropriate synchronous video exam during nurse triage and testing if necessary, patients may be discharged from an intake or triage area. This will keep open critical ED rooms for the more acutely ill patients arriving.

A significant risk to the health care team comes from our desire to check on patients; in our ED, we deployed Microsoft Surface Pro devices to reside in our patient care rooms. Attending physicians and other



FIGURE. Telehealth can amplify that work via the InTouch Health software platform via a feature called “multi-presence,” allowing for multiple participants to engage a patient simultaneously.

members of the provider care team, nursing, and consulting services, as well as ancillary teams such as registration and social work are able to have access into each room remotely and see patients virtually. Consider how often HCWs re-enter rooms to re-examine or communicate with patients; without a telehealth mechanism, this approach would consume massive and unsustainable amounts of PPE. Starting mid-March through May, we observed 3508 uses with a median time of 1.5

minutes. We suspect the majority of uses are for patient reassessments for pain or therapeutics. However, it can be argued that this is 3508 PPE saved or potentially 3508 less HCW exposures for patients with COVID-19 symptoms.

For more high-risk situations, devices were deployed to our resuscitation and negative airflow rooms to facilitate lean teams and observe for PPE breaches. These are rooms where high-risk procedures (such as intubation) and aerosol generating activities (such as nebulizers) occur. Through these devices, we are able to locate our recording nurse outside the care room and facilitate more clear communication between the team in the room and the supply runners to ensure expeditious care of these oftentimes critically ill patients.

In addition, the Mayo Clinic Center for Connected Care is liberally deploying Microsoft Surface Pro devices across the rural Mayo Clinic Health System EDs, allowing for any quarantined, well ED physicians to see low acuity patients and off load clinical surge.

Deployment of telehealth internally on the academic campus ED creates new conceptual use that will drive the conversation on future care delivery. The future of telehealth and health care will be debated following this crisis. We predict a profound change to the current state of health care operations.

PREHOSPITAL EMERGENCY CARE AND EMERGENCY MEDICAL SERVICES

Emergency medical services (EMS) are also at the forefront of this pandemic. Urgent efforts are underway to modify guidelines and protocols for EMS teams to care for COVID-19 known or suspected patients while simultaneously protecting teams and conserving PPE resources. Mayo Clinic Ambulance has been developing and testing a community paramedic program in partnership with the TeleEM program and recently completed a feasibility study on field telehealth. The feasibility and early clinical results were promising. Now, building on that work our EMS system spanning Minnesota and Western Wisconsin is

well positioned to be the community pandemic response supported by the TeleEM team.

Mayo Clinic Ambulance is actively deploying telehealth solutions to all of the ambulance teams across the network. Using a Toughbook (Panasonic, Inc.) and the InTouch Health software, teams will be able to audio-video link to on-duty TeleEM or EMS physicians in out-of-hospital locales for guidance and triage.

Paramedic crews will face unique challenges in the coming weeks and months. Non-pandemic, normal operations are typically transporting patients for evaluation in an ED. However, during a pandemic with surge, with limited PPE and resources in short supply, EMS teams will conceivably need to make challenging decisions during field resuscitations and whether patients should be transported for care. TeleEM and EMS physicians can support decision making using synchronous advice to frontline paramedic teams delivering care.

CONCLUSION

Whether in symptomatic patients' homes for remote monitoring, ambulances in the field for transport, tents outside health care facilities for screening and testing, EDs for diagnosis and treatment, or in the hands of all acute care providers for consultation, telehealth tools are being deployed across the continuum of EMS and emergency medicine to help limit disease spread, reduce HCW exposure, and conserve valuable PPE.

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