Keep Calm and Log On: Telemedicine for COVID-19 Pandemic Response

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The field of telemedicine, in which clinicians use remote evaluation and monitoring to diagnose and treat patients, has grown substantially over the past decade. Its roles in acute care medicine settings are diverse, including virtual intensive care unit (ICU) care, after-hours medical admissions, cross coverage, and, most aptly, disaster management.[1]

At HealthPartners, a large integrated healthcare delivery and financing system based in the Twin Cities region of Minnesota, we have used provider-initiated telemedicine in hospital medicine for more than 2 years, providing evening and nighttime hospitalist coverage to our rural hospitals. We additionally provide a 24/7 nurse practitioner-staffed virtual clinic called Virtuwell.[2] Because we are now immersed in a global pandemic, we have taken steps to bolster our telemedicine infrastructure to meet increasing needs.

SARS-CoV-2, the causative agent of COVID-19, is a novel coronavirus with the capability to cause severe illness in roughly 14% of those infected.[3] According to some estimates, the virus may infect up to 60% of the US population in the next year.[4] As the pandemic looms over the country and the healthcare community, telemedicine can offer tools to help respond to this crisis. Healthcare systems leveraging telemedicine for patient care will gain several advantages, including workforce sustainability, reduction of provider burnout, limitation of provider exposure, and reduction of personal protective equipment (PPE) waste (Table). Telemedicine can also facilitate staffing of both large and small facilities that find themselves overwhelmed with pandemic-related patient overload (PRPO). Although telemedicine holds promise for pandemic response, this technology has limitations. It requires robust IT infrastructure, training of both nurses and physicians, and modifications to integrate within hospital workflows. In this article, we summarize key clinical needs that telemedicine can meet, implementation challenges, and important business considerations.

BACKGROUND

Our organization currently uses telemedicine to provide after-hours hospital medicine coverage from 6 PM to 8 AM at five rural

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and critical-access hospitals. We utilize commercial telemedicine carts on-site at hospitals and company-provided laptops at home. Our video visits are completed using enterprise video software and commercial digital stethoscopes. In the past month, we have increased our capacity, including at two large tertiary-care hospitals, by adding web cameras to existing mobile workstations and purchasing additional laptops for new telemedicine providers. Major barriers we encountered included cost, credentialing providers across multiple sites, and equipment testing. However, with close coordination with executive leadership, use of disaster credentialing, and robust IT support, we have been able to move past these obstacles in expanding our telemedicine infrastructure for support during this crucial time.

APPLICATIONS

Patient Triage

Limiting exposure in the community and in the acute care setting is key to "flattening the curve" in pandemics.[5] Triaging patients by telephone and online surveys is an important method to prevent high-risk patients from exposing others to infection. For example, since March 9, 2020, over 20,000 patients have called in weekly for COVID-19 screening. Although our organization introduced drive-up testing to reduce exposure, patients are still presenting to our clinics and emergency rooms in need of screening and testing. In several of our clinics, patients have been roomed alone to facilitate screening in the room by use of Google Duo, a free video chat product. Rooms with telemedicine capabilities allow patients with potentially communicable infections to be evaluated and observed while avoiding the risk of viral transmission. Additional considerations could include self-administered nasal swabs; although this has comparable efficacy to staff-administered swabs,[6] it has not yet been implemented in our clinics.

Direct Care

Virtual care, specifically synchronous video and audio provider-initiated services, is a well-established modality to provide direct care to patients in acute care and ambulatory settings.[7] Telemedicine can be deployed to care for hospitalized patients in most locations as long as they meet the operational requirements described below. With a bedside nurse or other facilitator, patients can be interviewed and examined using a high definition camera and digital peripherals, including stethoscopes, otoscopes, ophthalmoscopes, and dermatoscopes. COVID-19 patients or patients under investigation may be seen in this manner. In-person visits should remain part of patients' care as an important part of the provider-patient

TABLE. Telemedicine Applications for COVID-19 Pandemic Response

Application	Example(s)
Patient Triage	Online screening tool with/without video; remote monitoring of triage rooms with self-administered NP[a] swabs
Direct Care	Telemedicine equipment[b] used by attending services as adjunct to standard bedside rounding; also used by specialists[c] to see COVID-19 suspected or confirmed cases at rural sites without usual access
Exposure Reduction	Telemedicine equipment[b] placed in patient room and at nurses stations to limit entry/exit of isolation rooms; also used by specialists[c] with multiple patients at tertiary or quaternary care sites to limit exposure
Provider Shortages	Ill or self-monitoring providers can round on and care for admitted patients from home

[a]NP: nasopharyngeal
[b]Mounted screen with camera, tablet/laptop with integrated camera, or similar
[c]eg, Infectious Disease, Cardiology, Critical Care, Pulmonology

relationship[8]; however, telemedicine could still be deployed to provide direct care and monitoring to these patients while minimizing exposure to healthcare personnel. Additionally, telemedicine can be used for specialist consultations that are likely in high demand with COVID-19, including infectious disease, cardiology, and pulmonology.

Exposure Reduction and Resource Allocation

Currently in the United States there are concerns for shortages of PPE including surgical masks and N95 respirators. Telemedicine can reduce provider exposure, increase provider efficiency, and curtail PPE utilization by minimizing the number and frequency of in-room visits while still allowing virtual visits for direct patient care. For instance, our nursing staff is currently using telemedicine to conduct hourly rounding and limit unnecessary in-room visits.

We recommend keeping telemedicine equipment within individual isolation rooms intended for COVID-19 patients in order to eliminate the need for repeated cleaning. For other patients, a mobile cart could be used. Most commercial video software can autoanswer calls to allow for staff-free history taking. For a thorough physical exam, a bedside facilitator is need for use of digital stethoscopes and similar peripherals.

Provider Shortages and Reducing Burnout

Because SARS-CoV-2 is a highly contagious pathogen that can spread prior to symptom presentation, current CDC guidelines recommend self-monitoring at home for health care workers who have a healthcare-related exposure to a COVID-19 patient.[9] This can leave significant gaps in coverage for healthcare systems. For example, in Vacaville, California, one positive case resulted in over 200 health care workers unable to work on site.[10]

Large volumes of acutely ill patients, coupled with the risk of ill or quarantined providers, means provider shortages due to PRPO are likely to occur and threaten hospitals' ability to care for patients with or without COVID-19. Furthermore, given increased patient loads, frontline staff are at exceptionally high risk of burnout in pandemic situations. Hospital medicine teams will need contingency plans to meet the needs. Using telemedicine to protect the workforce and maintain staffing levels will reduce that risk.

Telehospitalists can see and examine patients, write orders, and maintain patient service lines much like in-person providers. Recently, we have used it when providers are ill or self-monitoring. In multisite systems, telehospitalists who are privileged in multiple hospitals can be efficiently deployed to meet patient care needs and relieve overburdened providers across hundreds of miles or more.

Enabling patient rooms for telemedicine allows telehospitalists and other providers to see hospitalized patients. Furthermore, quarantined hospitalists can continue to work and support in-person clinical services during PRPO. Providers in high-risk groups (eg, older, immunosuppressed, pregnant) can also continue caring for patients with telemedicine while maintaining safety. As schools close, telemedicine can help providers navigate the challenge between patient care and childcare responsibilities.

OPERATIONAL REQUIREMENTS

The basic element of telemedicine involves a computer or monitor with an internet-connected camera and a HIPAA-compliant video application, but implementation can vary.

Recent changes have allowed the use of popular video chat software such as FaceTime, Skype, or Google Duo for patient interactions; with a tablet attached to a stand, organizations can easily create a mobile telemedicine workstation. Larger monitors or mounted screens can be used in patient areas where portability is not required. A strong network infrastructure and robust IT support are also necessary; as of 2016, 24 million Americans did not have broadband access, and even areas that do can struggle with wireless connectivity in hospitals with thick concrete walls and lack of wi-fi extenders.[11]

With the addition of a digital stethoscope, hospitalists can perform a thorough history and physical with the aid of bedside staff. This requires dedicated training for all members of the care team in order to optimize the virtual hospitalist's "telepresence" and create a seamless patient experience. Provider education is imperative: Creating a virtual telepresence is essential in building a strong provider-patient relationship. We have used simulation training to prepare new telehospitalists.

An overlooked, but important, operational requirement is patient education and awareness. In the absence of introduction and onboarding, telemedicine can be viewed by patients as impersonal; however, with proper implementation, high patient satisfaction has been demonstrated in other virtual care experiences.[12]

FINANCIAL CONSIDERATIONS

Though several health systems offer "tele-ICU" services, the number of hospital medicine programs is more limited. The cost of building a program can be significant, with outlays for equipment, IT support, provider salaries, and training. While all 50 states and the District of Columbia cover some form of fee-for-service live video with Medicaid, only 40, along with DC, have parity laws with commercial payors. Medicare has historically had more restrictions, limiting covered services to specific types of originating sites in certain geographic areas. Furthermore, growth of telehospitalist programs has been hampered by the lack of reimbursement for "primary care services."[13]

With passage of the Coronavirus Preparedness and Response Supplemental Appropriations Act of 2020, geographic and site restrictions have been waived for Medicare reimbursement.[14] Providers must still demonstrate a prior relationship with patients, which requires at least one encounter with the patient in the past 3 years by the same provider or one with a similar tax identification number (TIN). All hospitalists within our group are identified with a common TIN, which helps to meet this requirement for patient with recent admissions. However, clear guidance on reimbursement for primary care services by acute care providers is still lacking. As the utility of telemedicine is demonstrated in the hospital setting, we hope further changes may be enacted.

Organizations must properly credential and privilege telehospitalists. Telemedicine services may fall under either core or "delegated" privileges depending on the individual hospital. Additionally, while malpractice insurance does typically cover telemedicine services, each organization should verify this with their particular carrier.

SUMMARY

The COVID-19 pandemic has created a systemic challenge for healthcare systems across the nation. As hospitalists continue to be on the front lines, organizations can leverage telemedicine to support their patients, protect their clinicians, and con-serve scarce resources. Building out a virtual care program is intricate and requires significant operational support. Laying the groundwork now can prepare institutions to provide necessary care for patients, not just in the current pandemic, but in numerous emergency health care situations in the future.

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