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COVID-19: Launching Neurosurgery into the Era of Telehealth in the United States

Christina Huang Wright[1,2], *James Wright*[1,2], *Berje Shammassian*[1,2]

The authors discuss the implications of the COVID-19 pandemic on the use of telehealth in the United States.

INTRODUCTION

Throughout history, natural disasters, pandemics, and violent conflict have given rise to monumental innovations in health sciences and medical technologies. The 1918 Spanish influenza revolutionized public health with the emergence of health ministries, disease reporting, and national health surveys. Medical experience gleaned during World War I, coincided with developments of blood typing and refrigeration leading to the advent of blood banking, a process that has impacted tens of millions of lives. During the Korean War, MASH surgeons pioneered direct arterial repair for limb preservation in solders, reducing significantly the number of required amputations.[1]

At present, the ongoing COVID-19 pandemic has revealed gaps in public health infrastructure and health system capacity, in addition to disparities in resource allocation. These deficiencies will undoubtedly bring future changes in governance and disaster-preparedness legislation. Currently, however, this challenging time has promoted novel approaches to health care delivery, in addition to the rapid incorporation technology. Telehealth, in the setting of mandated social distancing and restrictions on nonessential cases and clinic visits, has stolen the spotlight.

Neurosurgery is poised to take advantage of this disruptive innovation. Telehealth and the neurologic sciences are intertwined. Among the earliest uses of telemedicine was the evaluation of patients with stroke for thrombolysis candidacy.[2] Applications have continued to expand to include neurotrauma, epilepsy, Parkinson disease, stroke rehabilitation, and chronic pain, among others.[3-9]

ADVANTAGES

There are innumerable potential advantages of continuing to expand this model of health care delivery. The major benefit is the ability to overcome geographic and socioeconomic barriers to elective and emergency subspecialty care. The use of telehealth systems increases access for patient populations who reside in rural areas, do not have the means to travel or afford childcare, do not have the economic means to miss work, or have decision-makers who cannot physically be present. It provides subspecialty services between or within hospital systems that do not or cannot independently support a team of neurosurgeons at all hospital sites. It also allows for the consolidation of neurosurgical care at facilities with experience and streamlined workflows.

LIMITATIONS

However, to ensure sustainability, the limitations and challenges associated with telehealth in neurosurgery and health care overall must be addressed. With all emerging technologies, questions of cost, quality, liability, ethics, implementation, regulations, and financial compensation must be considered. Currently health care delivery systems contain a patchwork of siloed health information systems with underutilized or cumbersome health information exchange networks. Ensuring the safe and complete transmission of a patient's record between systems can be challenging for information technology departments and care providers. Cost and administrative challenges are a significant barrier to multistate telehealth licensure. Although multistate licensure for telehealth emerged in the form of Interstate Medical Licensure Compacts in 2017, presently it only exists in 26 states and still requires physicians to pay licensing fees for each state.

RESEARCH

Ultimately, the evidence-based literature must demonstrate clinical equipoise between telehealth and its traditional clinical archetype. Outcomes with regard to clinical results, timely access to care, patient satisfaction, and cost reduction are research areas that require exploration. Models for telehealth success must be shared and deserve prioritization at national meetings.

Research must focus on the design of standardized and sufficiently sensitive questions to substitute for the lack of an in-person neurologic examination. Eliciting subtle myelopathy, performing a cranial nerve examination, or assessing gait abnormalities can be challenging in telemedicine. Interrater reliability is promising in the acute stroke setting but these studies have the advantage of in-person emergency physicians or nurses to assist with National Institutes of Health Stroke Scale administration.[10,11] Neurologic examination scales, such as motor strength testing and myelopathy scoring systems, will require standardization and validation to ensure quality in telehealth care. Further, clinically concerning thresholds must be established to allow for expedient identification and triage of acute life-threatening pathologies.

UNINTENDED CONSEQUENCES

Preparations must also be made for the unintended consequences of increased neurosurgery availability. The expansion of telehealth and improved access may result in redundant visits or an increase in the proportion of no-shows. Each appointment may counterintuitively require more time per visit. Clinics with previously high surgical yields may be subsequently inundated with second opinions or nonoperative consultations. From a systems and workflow standpoint, the time and expense related to initiating a telehealth service is often underestimated, and additionally has the potential to cause disturbances to traditional service pathways.[12] Hospital systems with advanced or easily accessible telehealth services may precipitate a

redistribution of patients to systems with underdeveloped neurosurgical infrastructure.

LEGISLATION

To address the inevitable obstacles in incorporating new paradigms of care, the political arm of neurosurgery must help to shape favorable state and federal legislation that will likely emerge in the post-COVID-19 era. Currently, telehealth is functioning at a level of loosened restrictions because of the Centers for Medicare and Medicaid Services 1135 waivers, which were enacted when states and the federal government declared a public health emergency. The waivers loosen restrictions on prior authorization requirements, relax enrollment requirements to expand provider interstate availability, and facilitate reimbursement for care in alternative settings. Alternative settings for telehealth include the permitted use of Google Hangouts, Facebook Messenger video chat, and Apple FaceTime. The Health and Human Services Office for Civil Rights issued a Notification of Enforcement Discretion enabling health care providers to use the earlier mentioned modalities without the risk of penalties imposed by the office for HIPAA violations[13]; however, a postpandemic contraction is likely to occur with less lenient regulations and a return to secure and HIPAA compliant platforms.

CONCLUSIONS

It is safe to say, whether the U.S. health care system is prepared or not, the COVID-19 pandemic will lead to the integration of telehealth into all aspects of care. Neurosurgery has always been strongly linked with innovation and technological progress. Further, the adeptness with which Generation X, and especially Generation Z, maneuver through complex digital networks and ever-changing social media platforms, has primed early career neurosurgeons to become leaders in this field. It is crucial that neurosurgery is proactive in the process of designing and implementing telehealth services to provide continued access to quality care for patients. These are the crucial formative years for telehealth in the United States, and involvement of early career neurosurgeons in the political, research, and clinical application of telehealth will shape what will likely be a redefined new era of health care delivery.

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From the [1]Department of Neurological Surgery, University Hospitals Cleveland Medical Center, Cleveland, Ohio; and [2]Case Western Reserve University School of Medicine, Cleveland, Ohio, USA

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