

Novel Coronavirus (COVID-19): telemedicine and remote care delivery in a time of medical crisis, implementation, and challenges

Joshua P. Kronenfeld,¹ Frank J. Penedo²

¹Division of Surgical Oncology, The DeWitt Daughtry Family Department of Surgery, University of Miami Miller School of Medicine, 1611 N.W. 12th Avenue, Holtz ET 2169, Miami, FL 33136, USA

²Department of Medicine and Psychology and Sylvester Comprehensive Cancer Center, University of Miami, Miami, FL 33146, USA

Correspondence to: J. P. Kronenfeld, jkronenfeld@umiami.edu

Cite this as: *TBM* 2021;11:659–663
doi: 10.1093/tbm/ibaa105

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Abstract

The novel Coronavirus (COVID-19) caused by the SARS-CoV-2 virus has led to many challenges throughout the world, one of which is the delivery of health care to patients while they remain home. Telemedicine, or the use of electronic information and telecommunication technologies to support and promote long-distance clinical health care, has been utilized by health care providers for many years, but its widespread implementation did not occur until the onset of the COVID-19 pandemic. Currently, it has become the primary mechanism of care delivery for patients during the COVID-19 pandemic. While obstacles are present for hospitals and providers to establish these services, most barriers exist with patient access. Patients require advanced technical support, translator services, and other measures to become comfortable engaging in a telemedicine encounter. In addition, appropriate follow-up must be provided for chronic medical illnesses and malignancies, helping to prevent the evolution of these conditions during the COVID-19 crisis. Finally, we must ensure equity for all patients seeking to access health services, including those of lower socioeconomic status. Many of these patients rely on public hotspots or library computers for their internet connectivity, but this is likely not conducive to a clinical encounter. These barriers must be addressed to ensure health equity for all patients seeking care. Telemedicine can connect patients and providers during this time of crisis and hopefully will serve as a model for continued use after the pandemic has abated.

Keywords

COVID-19, Telemedicine, Telehealth, Health care disparities, Cancer survivorship, Chronic medical care

BACKGROUND

The novel Coronavirus (COVID-19) is primarily a respiratory illness, caused by the SARS-CoV-2 virus, with highly contagious potential and often lethal consequences [1]. Its ability to cause widespread illness and death is clear and, to date, there are over 3 million cases in the USA with 150,000 of our citizens succumbing to the disease [2, 3]. With this pandemic rapidly spreading, the USA was faced with the difficult decision to limit gatherings and prevent nonessential travel [4, 5]. As physicians and hospital systems braced for the influx of COVID-19 cases, there emerged a need to provide continued health

Implications

Practice: An increased number of patients and practitioners are receiving or delivering care electronically via telehealth, but certain patient populations may not have equal access to these services.

Policy: Policymakers interested in increasing health care equity will need to address some of the concerns discussed in this commentary, including limited access to telehealth services in racial/ethnic minorities.

Research: Future research should be targeted at quantifying the impact telehealth has had on our health care system and vulnerable populations, helping physicians understand its impact and implications.

services to patients without physically interacting in an office setting [6, 7]. The health care needs are being addressed through remote encounters and internet-based health visits via the implementation of robust telemedicine networks [8, 9].

Implementation of a telemedicine program

Telemedicine is defined as the use of electronic information and telecommunication technologies to support and promote long-distance clinical health care [10]. The use of telemedicine is not unfamiliar to health care providers as nearly 76% of hospitals in the USA were utilizing telemedicine prior to the pandemic; however, a majority of patients still received their care through in-person encounters [11]. With patients required to remain at home, for nonurgent medical concerns, many physician and hospital groups have rapidly developed additional infrastructure not present prior to the outbreak [12, 13]. To facilitate the successful implementation of telemedicine programs, two key components were required.

The first component was the technology infrastructure, clinical workflow adjustments, and training for

the health care provider and patient alike to allow care to be effectively delivered remotely. Patient schedulers, health care navigators, and billing staff also required adjustments to their workflows, training, and implementing systems to arrange telemedicine visits. Privacy remains a major concern, and secure and Health Insurance Portability and Accountability Act compliant services needed to be employed. These services included platforms such as Facetime (Apple Inc., Cupertino, CA), Zoom (Zoom Video Communications, San Jose, CA), or other similar tools allowing audio and video communication between providers and patients [12]. In addition to establishing an avenue for delivery of care, there needed to be the ability for providers to receive payment for these virtual encounters. The Centers for Medicare and Medicaid Services responded to this need by expanding reimbursement for telemedicine encounters, through the expansion of telehealth waiver, to provide compensation for remote services [14]. Establishing the infrastructure for health care providers, however, overcomes only half of the barriers to providing adequate health care remotely.

The second component required is to educate and equip patients with the tools necessary to interface with their providers. While the remote applications for video conferencing are readily accessible, a basic understanding of the system is required for the patients to connect with these services [12]. The first encounter with a patient often requires additional time to orient a patient and allow for them to become comfortable with the virtual tools, as well as evaluating connectivity. In our health care system, patient navigators contact patients prior to physician encounters to help them establish a connection, troubleshoot connectivity issues, and understand the technology before interfacing with a provider. The initial time required by professional staff for first-time encounters is immense, requiring up to 1 hr, but future appointments seem to progress more efficiently without much external oversight [12].

Despite the challenges in training and implementation of telemedicine, remote care affords a health care center and its patients multiple potential benefits. For patients who live far from a health care facility, such as those in rural areas or patients who wish to see a physician at a distant location, physicians can be accessed by utilizing voice or video communications. The ability to provide care to patients at a distance greatly extends the geographic footprint of a health care system [15]. Patients also enjoy benefits of telemedicine encounters as waiting time in the office is often reduced and time spent traveling to and from appointments is eliminated [15]. For patients caring for children or other

persons, they can be evaluated from the comfort of their homes without endangering others by bringing them to the visits.

Challenges and barriers

While telemedicine allows for remote medical care during the pandemic, there are many challenges that need to be addressed. As discussed above, computer and technology literacy remains a major barrier [16]. Additional obstacles include patient resistance to change how they interface with health care providers, language barriers, patient perceptions that telemedicine is impersonal and not trusted, and patient perception of information overload during encounters [16]. Some of these challenges are overcome, including the recruitment of certified medical interpreters to participate in the encounter [17]. To alleviate mistrust and feelings of impersonality, providers at our center are encouraged to interact with patients they have previously evaluated in clinical settings. Building trust with familiar providers can alleviate these concerns but is not practical for patients who require different providers or additional specialists. Some of the other barriers, such as resistance to change, can be more difficult to overcome, but greater understanding of telemedicine through media coverage has been helpful to assuage patient hesitations [18].

In addition to the implementation challenges faced by hospitals and providers in large, university-based or city-based settings, there are unique challenges faced by health care systems in rural environments. These small centers may not have the monetary or technological infrastructure to build such an intricate and robust telehealth network. There are confidentiality, reimbursement, and liability issues that need to be resolved as well [19]. Another challenge is that emergency services or referral centers must be easily accessible should a health care provider discover a condition requiring immediate assistance [20]. In rural areas, these issues pose challenges, including increased health care transportation costs, as well as increased transportation times that may lead to adverse outcomes for patients. To combat these disparities between rural health care centers, when compared to academic or city-based centers, significant innovation is required to be able to integrate a robust telehealth network into their repertoire. Government support has been garnered in the past, including the American Recovery and Reinvestment Act of 2009, bringing funding and resources to these rural centers [21, 22]. Additional local, state, and federal initiatives are needed to remove many of these barriers plaguing rural communities in order to develop telemedicine programs accessible to patients throughout the nation. One such program that was developed in the past is the “Enhancing Rural Population Health Care Access and Outcomes through the Telehealth EcoSystem”

program through the Tuskegee Macon County Community Foundation [23]. This platform and organization have been working to develop a robust infrastructure and telehealth network across rural Alabama. For the current health care crisis, additional strategies needed to be developed.

During the COVID-19 pandemic, there were a few key policy changes that aided in the implementation of telehealth programs in rural communities. In addition to the expansion of reimbursement for Medicare services (as described above), the U.S. Department of Health and Human Services and American Medical Association have issued detailed instructions and guides for implementing a telehealth program [14, 24, 25]. The federal government offered funding assistance for telehealth programs in rural sites, and the Centers for Medicare Services waived requirements for hospital bed capacities and lengths of stays for patients in rural communities that may require hospitalization [25]. While challenges still remain, and further innovation may be needed in these rural populations, these strategies have helped to overcome some of the challenges of rural hospitals and health care systems during the COVID-19 pandemic.

It should also be noted that health care systems affected earliest by the pandemic were not able to begin a telehealth program as readily as health care systems affected later. For programs balancing competing demands, such as exceedingly high patient volumes, there may have been a time delay in implementation of telehealth programs as they cared for many critically ill inpatients [26, 27]. In institutions where telehealth could be robustly and rapidly established, up to 97% of all health care encounters were telehealth encounters during portions of the COVID-19 pandemic [28]. It is important that all institutions make a push for establishing a robust telehealth network that can be utilized should this pandemic, or other health care emergencies, be exacerbated or occur where in-person health care encounters are discouraged.

Finally, patients requiring invasive procedures are also limited in the utility that telemedicine can provide and often must present in person to be evaluated [29]. Additionally, many patients require consistent follow-up with health services, including those with end-stage kidney disease, requiring dialysis several times each week [30, 31]. While patients with comorbidities have unique challenges, patients with malignancies face even greater barriers to overcome.

Challenges for patients with malignancies

Patients who are being treated for cancer also face additional challenges. These patients often have a predetermined treatment regimen required based on the stage and type of cancer diagnosis that is often complex. In many cases, the pandemic has

caused interruptions to these regimens, which cannot be ameliorated through telemedicine. For patients with complex chemotherapy and radiation schedules, innovative strategies have been required to manage their disease. For example, delays in treatment was deemed acceptable for patients with very low-risk prostate cancer, while alterations in regimen were required for other malignancies [32, 33]. In our facility, and others around the country, increased telemedicine visits are being utilized, and adjusted criteria have been employed to determine the urgency of medical or surgical interventions [34]. Symptoms are closely monitored remotely, and providers rely heavily on patients to provide accurate descriptions of their progress. While we strive to prevent the spread of disease through in-person consultations, we must also make every effort to alleviate disease and prevent the increase in a patient's tumor burden [35].

An additional obstacle for patients being treated for cancer is the difficulty in obtaining radiologic imaging studies and laboratory analyses. While facilities remained open for critical studies, many physicians were required to forgo these tests to promote social distancing and limit unnecessary gatherings. Providers were asked to rely more heavily on their patient history and evaluation of symptomatology. For patients with malignancies, however, providers often depend on these studies to determine treatment algorithms and plan for surgeries, so these studies cannot be delayed. Navigating these challenges has increased the complexity of medical and surgical oncology practice during the pandemic.

Disparities in vulnerable populations

A persistent challenge when providing care via telemedicine is that telemedicine needs to attend to patients of diverse races, ethnicities, socioeconomic statuses, and geographical locations [36]. While telemedicine can help to reach patients in rural or remote locations, the patient must have sufficient infrastructure to facilitate a telemedicine visit [8]. High-speed internet service, while seemingly ubiquitous, may not be available to all [37]. Many patients, including those of lower socioeconomic status, may utilize local libraries or public hotspots for their Internet connectivity. In fact, it is estimated that up to 44% of people living below the poverty line use computers/Internet provided by public libraries [38, 39]. Due to privacy and anonymity, a public setting may be inappropriate for a patient to complete a health care visit. Furthermore, libraries and public wireless Internet hotspots were largely inaccessible or closed during the pandemic, exacerbating socioeconomic disparities. Additionally patients in rural communities, depending on satellite or remote connections, may have difficulty connecting to health care encounters due to unreliable connectivity. We can see how patients of lower socioeconomic status may be

at a great disadvantage during the pandemic, and it is important to provide these patients the ability to connect with providers so that economic challenges do not translate to poor health care outcomes.

While the technology gap may limit a patient's ability to access telehealth services, racial and ethnic considerations must be noted when striving to develop a telehealth program that can be equitably accessed by all patients. Studies have demonstrated that Hispanic patients have a higher use of smartphones when compared to African American patients, but both of these groups have a lower use than non-Hispanic White patients [40]. When implementing a telehealth network, health care systems must also acknowledge the availability of devices in their populations, which may limit the usage of telehealth services. Additionally, African American and Hispanic patients have different perceptions of telehealth when compared to nonminority groups. African American patients are particularly concerned with the physical absence of a physician, the ability to investigate a telehealth physician's qualifications, and the privacy-related issues of telehealth [41]. Hispanic patients are most often concerned with a physician's ability to accurately diagnose them correctly through the remote platform [41]. It is critical to have discussions with patients and community advocates/leaders in an effort address patient concerns and potential mistrusts with telehealth. It is critical to have discussions with patients and community advocates/leaders in an effort address patient concerns and potential mistrusts with telehealth. As with many new innovations, significant efforts must be made within the community and health care networks to gain the confidence of the patients served.

More information is continually being uncovered regarding the telehealth experience during the pandemic, and health care systems and policymakers may need to make adjustments to ensure that equitable care is accessible to all. In these vulnerable populations, research is needed to quantify the impact that a predominance of telemedicine has had on these underserved patients. Potential delays in care, due to discomfort or inaccessibility of telemedicine services, may have led to delays in medical diagnoses or oncologic care [42, 43]. These delays may have led to increased morbidity and mortality to patients in these vulnerable populations and must be addressed to prevent further inequity due to sociodemographic disadvantage.

CONCLUSION

Telemedicine, although not an innovation, has become the primary mechanism of care delivery for patients during the COVID-19 pandemic. While

obstacles are present for hospitals and providers to establish these services, most barriers exist with patient access. Appropriate follow-up should be provided for chronic medical illnesses and malignancies, helping to prevent the evolution of these conditions during the COVID-19 crisis. Finally, we must ensure equity for all patients seeking to access health services, including those of lower socioeconomic status. Telemedicine can connect patients and providers during this time of crisis and hopefully will serve as a model for continued use. After the pandemic has abated, aspects of the robust telehealth network will undoubtedly remain. Physicians will retain the deftness they have acquired with conducting encounters remotely, and patients will retain their interest in accessing health services without needing to appear in person. While telehealth may no longer be the primary means of health care delivery, it will be here to stay for the foreseeable future due to the many benefits afforded to patients and health care providers.

Acknowledgments

Funding: This research was funded by the National Institute of Health under a training grant (T32CA211034).

Compliance with Ethical Standards

Conflicts of Interest: JPK has no relevant conflicts of interest. FJP is a paid consultant for Blue Note Therapeutics.

Author Contributions: JPK: Conceptualization of idea, design of study, writing, and final approval. FJP: Conceptualization of idea, design of study, writing and critically revising, and final approval.

Ethical Approval: This article does not contain any studies with human participants performed by any of the authors. This article does not contain any studies with animals performed by any of the authors.

Informed Consent: This study does not involve human participants and informed consent was, therefore, not required.

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