Advancing Digital Health Equity: A Policy Paper of the Infectious Diseases Society of America and the HIV Medicine Association

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Summary: Social determinants of health impact readiness for telemedicine and other virtual healthcare. Disparities in telemedicine access in Infectious Disease and HIV clinics should be quantified and addressed in order to enhance digital health equity.

Abstract

The SARS-CoV-2 virus pandemic has revolutionized the practice of ambulatory medicine, triggering rapid dissemination of digital healthcare modalities, including synchronous video visits. However, social determinants of health, such as age, race, income, and others, predict readiness for telemedicine and individuals who are not able to connect virtually may become lost to care. This is particularly relevant to the practice of Infectious Diseases (ID) and HIV Medicine, as we care for high proportions of individuals whose health outcomes are affected by such factors. Furthermore, delivering high-quality clinical care in ID and HIV practice necessitates discussion of sensitive topics, which is challenging over video without proper preparation. We describe the "digital divide," emphasize the relevance to ID and HIV practice, underscore the need to study the issue and develop interventions to mitigate its impact, and provide suggestions for optimizing telemedicine in ID and HIV clinics.

Keywords: HIV; communicable diseases; telemedicine; policy

Introduction

Almost overnight, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic fundamentally changed the practice of ambulatory medicine in the United States (US). In response to the public health emergency, clinics swiftly launched or expanded options for healthcare delivery through synchronous *telemedicine* (real-time video conferencing) and other telehealth modalities (*telehealth* refers broadly to all remote electronic healthcare services, including video interactions, telephone communication, asynchronous messaging, and others). A report from the Department of Health and Human Services (HHS) highlights the unprecedented change, noting that 43.5% of Medicare visits in April 2020 (approximately 1.3 million visits per week) were conducted electronically – the report includes interactions by voice, voice and video, chat, or email – compared to 0.1% in February 2020 (approximately 2,000 per week) [1].

The immediate expansion of remote healthcare service delivery was facilitated by Congressional House Bill 6074, which allowed HHS to waive certain telemedicine restrictions, coupled with emergency declaration waivers from Centers for Medicare & Medicaid Services (CMS) [2-4]. These directives suspended regulatory obstacles to video visits; previously, patients had to live in designated rural or medically underserved areas and could not connect to visits from home. The declarations also expanded provider types who could bill for telehealth services and allowed use of remote communication applications that may not meet Health Insurance Portability and Accountability Act requirements. These new mandates, coupled with improved coverage from private payors, enabled the rapid and dramatic expansion of virtual healthcare. However, many of these regulatory decrees are temporary. Moreover, the accelerated adoption of remote healthcare has exposed critical gaps in access. Socioeconomic disparities prevent many vulnerable persons from benefiting from telehealth innovations; such disparities create a “digital divide” [5-7].

This digital divide, defined as unequal access to or ability to engage in care using technological means, is not new, but has become more apparent with the recent proliferation of video visits. As an example, researchers analyzed data from Cardiology clinic visits since onset of the SARS-CoV-2 pandemic and results reveal that social determinants of health significantly impact a person's ability to engage via telehealth [8]. In general, video visits are preferred over telephone visits [9], as they allow for better communication, a limited physical assessment, and enhanced reimbursement. However, female, older, lower income (below $50,000 per year), and non-English-speaking patients were more likely to complete a telephone visit instead of a video visit [8]. Another troubling finding: non-English proficiency was associated with a more than 50% decrease in the use of either video or phone visits. Similarly, investigators examined data from Gastroenterology clinic visits during the pandemic and found that Black race and age above 60 were independent predictors of completing a phone visit instead of video and of lower usage of online portals [10].

Practitioners in the fields of Infectious Diseases (ID) and HIV Medicine care for a disproportionately large number of individuals whose health outcomes are affected by social determinants of health, including race, ethnicity, gender, income, housing stability, mental health, substance use, education, language, incarceration history, and others [11,12]. The degree to which social determinants of health predict digital health readiness is striking. They influence a person's likelihood of being able to participate in video visits, communicate by electronic health record (EHR) portals, and request appointments or prescription refills electronically [13,14]. In addition, most mobile health applications are not designed to engage individuals with limited English proficiency [13]. Efforts to eliminate health inequities based on the intersectionality of various socioeconomic factors must also address the influence of such factors on digital health access.

For an individual to benefit from digital healthcare, experts describe three requirements: 1) technology, 2) technical literacy, and 3) broadband internet connectivity [15]. We would add a fourth related, yet independent, need: *personal privacy*. For individuals with conditions that sadly remain stigmatizing (HIV, viral hepatitis, sexually transmitted infections, tuberculosis, and others) or when discussing personal matters (sexual health, gender affirming care, intimate partner violence, mental health, substance use), personal privacy becomes a crucial, yet sometimes scarce, commodity outside of the clinic. These sensitive discussions are critical to delivery of high-quality care in ID and HIV Medicine; raising such conversations by video or phone can create ethical dilemmas for the patient and provider if proper planning and preparations are not completed.

Here, we aim to examine how critical digital health access points – technology, technical literacy, broadband connectivity, and personal privacy – impact care. We seek to highlight unique considerations for ID and HIV practitioners, acknowledge ethical dilemmas that may arise in the practice of telemedicine as well as risks of exacerbating implicit biases, and recommend that as a community of practitioners we work towards interventions to relieve these pressure points. We emphasize the importance of collecting data, tracking, and researching disparities in telehealth access in order to devise interventions and promote digital health equity.

Social Determinants of Health Predict Readiness for Telemedicine

The most obvious requisite for telemedicine is a device with audio and video capability, such as a desktop, laptop, smartphone, or tablet. However, one must also have consistent broadband internet connectivity. Access to any internet service is not the same as access to reliable broadband; patients may have some internet access at home or on their device, but lack stable broadband or sufficient data speeds and quantities for video interactions. Additionally, to access virtual visits, a person must feel comfortable using and interacting with their device and understand how to connect to EHR portals and video interfaces. Participation in telemedicine becomes more difficult if a

person requires care through multiple healthcare centers that use different EHR portals and video apps.

As an illustration of disparities in device ownership and broadband internet access, 2016 data from the US Census Bureau showed that 80.9% of white households had a desktop or laptop computer, compared to 63.9% of Black and 67.5% of Hispanic households, with similar discrepancies in broadband subscriptions [16]. Analyses from the Pew Internet and American Life Project demonstrate stark differences in smartphone ownership and home broadband use by age, race, income, and education level [17] [**Figure 1**]. Individuals from ethnic minority or lower income groups are more likely to be "smartphone dependent" (rely on a phone for internet service), which may be less dependable than an established device with stable broadband connectivity in the home [18,19]. Additionally, urban versus rural discrepancies in telemedicine access remain stark. Many rural areas in the US still lack high-speed broadband connectivity and individuals living outside of metropolitan and urban areas are less likely have the capacity to complete video visits from home [13,16,17]. Telehealth visit increases in recent months have been more modest in rural compared to urban areas, at least partly due to differences in broadband availability [1].

Age and social isolation are also critical factors that reduce the likelihood of engaging in virtual healthcare. Studies using 2018 data estimated that of older adults in the US, 38% were not ready for home-based video visits; technical inexperience emerged as a predominant barrier [20]. Additionally, 20% of older adults were unready for phone visits due to limited hearing, vision, or cognition. Lack of telemedicine readiness was more likely for individuals who were older, male, unmarried, Black or Hispanic, resided in non-metropolitan areas, had less education, lower income, and poorer self-reported health. A similar analysis identified significant barriers to telemedicine for

many Medicare beneficiaries: 41.4% lacked a desktop or laptop computer with high-speed internet connection at home, 40.9% lacked a smartphone with wireless data, and 26.3% lacked both (even higher for Black or Hispanic individuals or persons with lower income, high school education or less, Medicaid, or a disability) [21].

In ID and HIV clinics, practitioners may care for large proportions of individuals who experience an intersection of factors that make them especially vulnerable to these disparities in digital health access. For example, a study that surveyed persons with HIV (PWH) and hepatitis C as well as a history of substance use found that while 86% owned a mobile phone, there were high rates of phone turnover and only 52% had daily internet service [22]. Researchers in a metropolitan area surveyed 103 cisgender women with HIV (median age 50, a majority Black, half with less than high school education and half unstably housed) and determined that 61% were active internet users, but most relied on a mobile phone for access. Those who were older, had lower income, or less social support were less likely to use the internet [23]. Given sizeable numbers of individuals with HIV, hepatitis C, and other infectious diseases in rural regions, as well as recent outbreaks associated with the opioid epidemic, geographic disparities in digital healthcare access are also highly relevant [24,25]. Furthermore, large proportions of patients in ID and HIV clinics may be older and rates of social isolation are dramatically high, so the digital divide is germane to ID and HIV practice [26-28].

Undoubtedly, some individuals benefit greatly from telemedicine. Individuals who live far from the clinic or have barriers to transportation or mobility, for example, may better engage in care by video as opposed to in-person, and indeed many individuals were ready and eager for telemedicine prior to the SARS-CoV-2 pandemic [1]. Remote visits reduce other burdens created by in-person appointments (lost time from work, childcare needs, or stigma that some feel when attending visits at an ID or HIV clinic) and video visits may add insights for the provider into the patient's living situation, thus augmenting quality of care (reminiscent of a home visit). Moreover, the ability to offer remote visits is critical during the current public health crisis and gives an opportunity to help

keep individuals who are vulnerable to severe SARS-CoV-2 infection home and safe. We assert that recent regulatory changes should be extended so that after the pandemic we can continue to utilize telemedicine to increase care access. However, we also believe it is important to recognize that social determinants of health predict ability to engage by telemedicine so that disparities can be quantified and addressed.

Concerns have been raised that telemedicine may contribute to "depersonalization of medicine" (less personal connection with patients when relying on distance visits) and data suggest that satisfaction with tele-visits may vary by age, gender, race/ethnicity, and other factors [10,29-31]. Video visits may also perpetuate or exacerbate provider implicit biases due to visualizing a patient's living environment or less personal interactions [32]. We must acknowledge and remain aware of these risks. Furthermore, while social determinants of health predict telemedicine readiness, one should never assume that a patient will or will not be able to engage in video visits based on demographic or clinical history alone. We need to carefully track, study, and understand which individuals in HIV and ID clinics benefit from telemedicine and which are excluded so that we can better identify and support individuals who can't connect. Acknowledging the digital divide will allow for analyses of ways in which telemedicine mitigates versus exacerbates healthcare disparities so that all may benefit from digital innovations. We recommend developing plans to assess each individual's readiness for telemedicine and focusing on ways to prevent disparities in care from widening.

Importance of Personal Privacy

As a real-life case scenario that raises important considerations around preparing for and conducting telemedicine visits, a provider logs into a video visit and the patient, a young Black man-who-has-sex-with-men, joins from the corner of the shelter where he stays, using a personal phone but without headphones. The patient, who has HIV, struggles with medication adherence due to drug use and mental health issues. Should the provider conduct this video visit? If so, how can it be done

safely and sensitively, protecting privacy and confidentiality? What preparations could have enhanced the likelihood of a successful visit?

This scenario illustrates an ethical dilemma that providers face more often in the era of frequent video visits. Patients may log into visits from a public space (park, parking lot, city street, public transportation, work site, etc.) out of necessity, or from various places in the buildings where they reside (including bathrooms) in an effort to keep discussions with their healthcare providers private. Although headphones may seem like a trivial accessory, they add an essential amount of privacy. Importantly, when a provider logs into a video visit, consent for conducting the visit by video should come first and should acknowledge risks to privacy, particularly if the patient joins from a public setting or does not have headphones. In some instances, the video visit should be rescheduled if privacy is a concern.

Clinicians must exercise judgment in deciding when to encourage in-person versus remote visits and certain medical issues necessitate an in-person visit, especially those that require a hands-on physical examination. Nowadays, the decision for in-person versus telemedicine also requires judgment about risk of SARS-CoV-2 infection in the local jurisdiction, patient risk factors for serious SARS-CoV-2 infection, availability of personal protective equipment, and risks of travel to the clinic, particularly if physical distancing is difficult. Unfortunately, this risk is greater for many individuals from lower income or minority ethnic groups, who are more likely to rely on public transportation and face a disproportionately elevated risk of SARS-CoV-2 infection [33].

Potential Interventions to Mitigate Effects of Digital Health Disparities

Research is needed to quantify and characterize the digital divide in ID and HIV, with the goal of understanding and alleviating virtual healthcare barriers. Rodriguez and colleagues recently outlined broad-scale interventions from various stakeholders that would help move towards digital health

equity in all fields and we support these recommendations [13]. Steps must be taken at the national, state, and local level. In addition to campaigns for expansion of broadband internet, advocacy is needed so that recent legislative, regulatory, and reimbursement changes persist and continue to support telehealth services and ensure payment parity after the emergency declarations end (payment parity for video and phone visits, as individuals who are unable to engage in care by video may rely on phone appointments to stay connected).

As an example of a state-level response to the public health crisis, the Washington State Healthcare Authority distributed licenses for a telemedicine application to clinics serving vulnerable persons and supplied donated phones to Native American tribes, Medicaid clients, persons enrolled in housing and employment support programs, and other vulnerable individuals [34]. These and similar interventions by other states should be replicated and their impact assessed. As an example of interventions at a healthcare institution, medical students at University of Washington created a Telehealth Navigation Project in which student volunteers contact individuals prior to scheduled telemedicine visits to help them prepare and connect, plus are creating a kiosk at the medical center where a volunteer teaches patients how to join video visits.

Other interventions that have been implemented or are in development to support telemedicine should be expanded. These interventions could be adopted by healthcare institutions, clinics, public health departments, community based organizations, and others, and should be supported with funding at the state and national level:

- Develop protocols to assess patient technical readiness and needs at clinical intake and update at each subsequent visit.

- Ahead of every telemedicine visit, provide instructions (in patient's language) for connecting and recommendations for maintaining privacy, such as use of headphones.
- Conduct a test visit to confirm capability, review the process, and ensure a plan for a safe space to conduct the visit (**Figure 2** provides a sample checklist).
- Develop programs that offer smartphones, tablets, or laptops to patients, and that provide headphones if a person does not have access to them; offering hardware devices is not a panacea because it does not address other barriers, like broadband access or other hurdles we have outlined, plus devices can be lost or stolen, but for some individuals it can make a major difference.
- Implement classes or other trainings to teach technical literacy, especially for individuals with most need, such as those with limited English proficiency or hearing or vision impairment.
- Ensure an option for language interpretation services (simultaneous video preferred over audio only) as well as options for hearing impairment (American Sign Language interpreters or closed captioning) and assess if individuals need assistance due to vision impairment or cognitive impairments; follow telehealth principles outlined by the Consortium for Citizens with Disabilities [35]
- Design virtual user interfaces, mobile health applications, websites, and other online health support tools to engage users of various language and cultural backgrounds and users with visual or hearing impairment.
- Provide a way that patients can access video visits besides the EHR portal; for example, secure HIPAA-compliant texting platforms can be used to message patients with instructions and links to their telemedicine visit.

- Train clinical staff, peer support teams, volunteers, and/or healthcare navigation specialists to help patients manage EHR portals and telemedicine tools.
- Design locations where individuals can join telemedicine visits that offer reliable connectivity, privacy, and careful cleaning and precautions to prevent SARS-CoV-2 infection (accessible stations in a parking lot or library, for example, or available devices and assistance at central community based organization sites) [36].
- Offer tablets with headphones and a private space to connect at group living sites, such as shelters (with careful cleaning and precautions to prevent SARS-CoV-2).
- For clinics and healthcare systems, carefully track which individuals appear to be absent from care, missing video visits, or relying on phone visits instead of video and develop outreach programs.
- Include health disparities as a key performance indicator on telemedicine dashboards and quality improvement interventions.
- Add telemedicine best practices to medical education and training curricula.

Conclusions

Telemedicine offers a powerful tool to ensure access to healthcare and some patients are benefiting dramatically from recent expansions. However, we need intentional interventions to ensure that this era of virtual healthcare does not exclude vulnerable persons from care. Local, state, and national approaches to address digital health equity and mitigate the impact of the digital divide on health outcomes for all patients are critical and should be a priority in ID and HIV Medicine.

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FIGURE LEGENDS

Figure 1. Smartphone and broadband subscriptions in the United States assessed by various social determinants of health. Recreated with permission from the Pew Research Center.

Figure 2. Sample telemedicine preparation checklist.

Figure 1

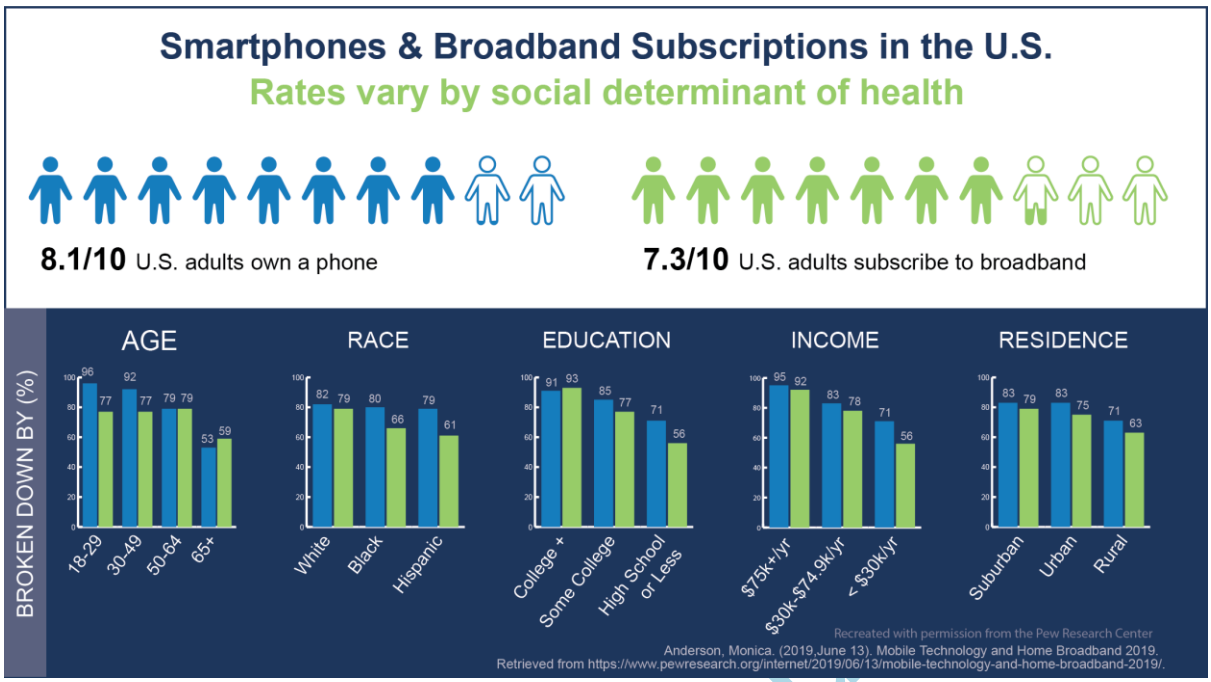
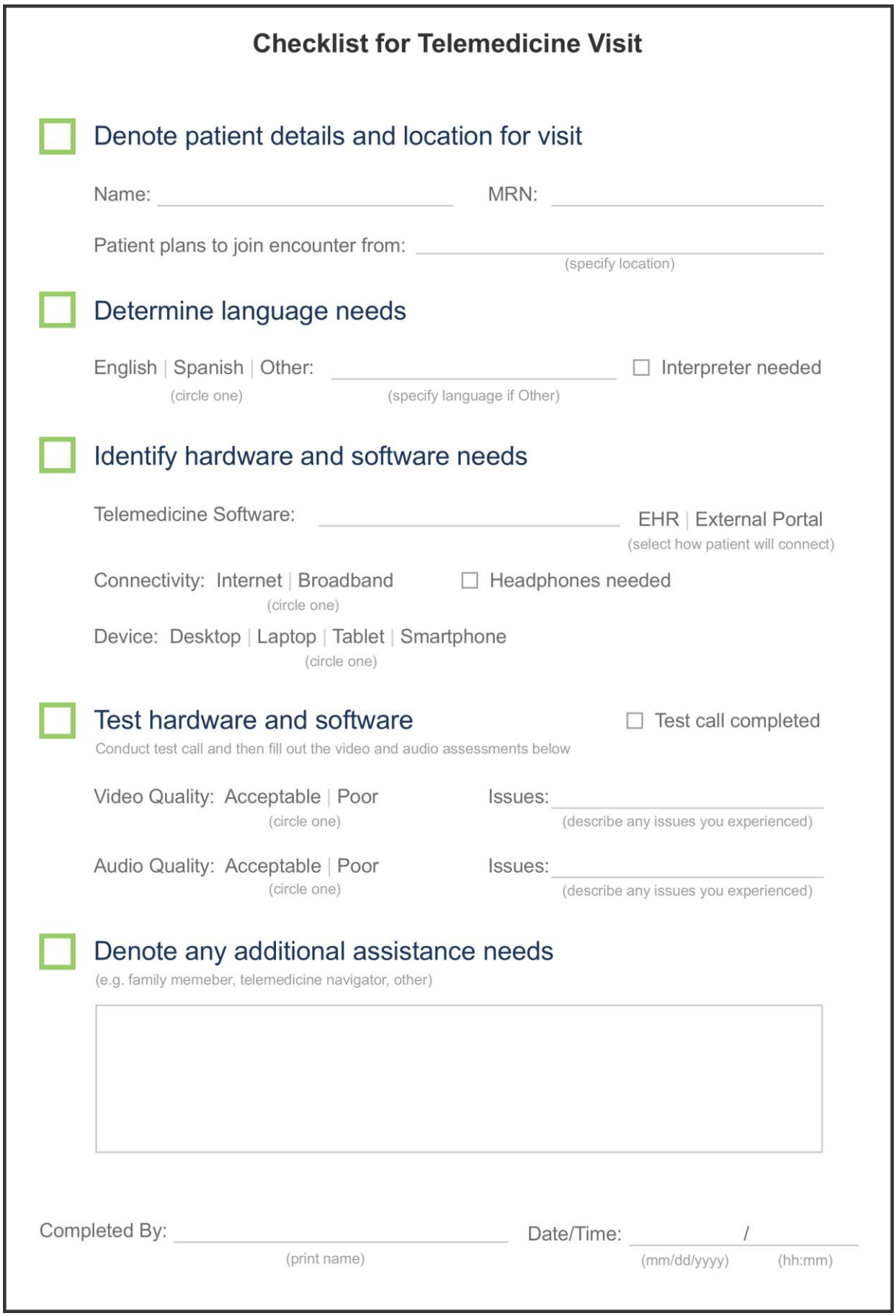


Figure 2



Checklist for Telemedicine Visit

Denote patient details and location for visit

Name: _____ MRN: _____

Patient plans to join encounter from: _____
(specify location)

Determine language needs

English | Spanish | Other: _____ ☐ Interpreter needed
(circle one) (specify language if Other)

Identify hardware and software needs

Telemedicine Software: _____ EHR | External Portal
(select how patient will connect)

Connectivity: Internet | Broadband ☐ Headphones needed
(circle one)

Device: Desktop | Laptop | Tablet | Smartphone
(circle one)

Test hardware and software

☐ Test call completed

Conduct test call and then fill out the video and audio assessments below

Video Quality: Acceptable | Poor Issues: _____
(circle one) (describe any issues you experienced)

Audio Quality: Acceptable | Poor Issues: _____
(circle one) (describe any issues you experienced)

Denote any additional assistance needs

(e.g. family memeber, telemedicine navigator, other)

Completed By: _____ Date/Time: ____/____
(print name) (mm/dd/yyyy) (hh:mm)