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AAMC Telehealth Technology and Functionality Recommendations to Promote Patient-Centered and Equitable Care

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Background

The COVID-19 pandemic necessitated a rapid implementation of telehealth, in many cases without the necessary technology, workflows, or organizational systems in place. Health systems, hospitals, clinics, and care teams rapidly transformed care delivery models to maintain patient access and continuity of care using telehealth tools. A prerequisite to patient access to a telehealth service is access to a reliable and functional device (e.g., phone, smartphone, tablet, laptop, or desktop) along with the capability for a secure and stable internet connection. Patients and communities that have been historically marginalized face a range of critical barriers to accessing care via telehealth. These barriers to digital inclusion include lack of broadband communications services or insufficient data plans; limited access to smartphones, tablets, and computers; devices insufficient to conduct a telehealth visit; gaps in digital literacy; language, cultural, or accessibility barriers; and a lack of trust.[1] As an example, there is no all-inclusive telehealth software that permits independent use for people with low vision. In March 2022, the Department of Justice issued web accessibility guidance under the Americans with Disabilities Act (ADA) that requires governmental entities and public businesses to make their websites inclusive and accommodating for people with disabilities.

To address these barriers, improve access to care for all patients, promote digital inclusion, and deliver high-quality patient-centered care, particularly in communities that have been economically or socially marginalized, the AAMC has developed a core set of functional requirements and recommendations regarding technology and infrastructure when selecting devices for furnishing a range of telehealth services. Recognizing that innovations in technology are not static, we have created adaptable best practices for functional requirements that can both withstand and support the fluidity of innovations. By advocating for and disseminating these recommendations, we aim to support:

- Health care systems ensuring that current and future telehealth services meet the needs of all patients.
- Providers facilitating access for their patients to devices and programs necessary for conducting telehealth visits.
- State and federal policymakers aligning public policies with the needs of all patients, including those for whom disparities adversely impact access to care via telehealth.
- Patient advocacy organizations striving for greater adoption of telehealth across all populations.

This guide does not supersede patient choice or the medical decision-making of the provider. The AAMC believes patients and providers are best suited to determine clinically appropriate treatment and care modalities to effectively address patient needs.

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[1] Eberly LA, Kallan MJ, Julien HM, et al. Patient characteristics associated with telemedicine access for primary and specialty ambulatory care during the COVID-19 pandemic. *JAMA Netw Open.* 2020;3(12):e2031640. doi:10.1001/jamanetworkopen.2020.31640.
Khoong EC, Nouri S, Lyles CR, Karliner L. Addressing equity in telemedicine for chronic disease management during the Covid-19 pandemic. *NEJM Catalyst.* 2020;1(3). doi:10.1056/CAT.20.0123.
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Objectives

The goal of these guidelines is to provide functional requirements and digital communication device and infrastructure recommendations to ensure device usability and access to telehealth for all patients, including those who struggle against economic marginalization, those who reside in rural communities, and those with physical disabilities and lower levels of digital and health literacy.

In this paper, we offer a framework for selection of telehealth tools based on patient care needs (medical complexity), end-user resources, and the specific characteristics of the patients being served when considered through an equity lens. This resource should be used to develop effective telehealth solutions across the health care ecosystem, including providers, clinics, hospitals, academic medical centers, payers, industry, advocacy organizations, patients, and policymakers at the federal, state, and local levels. This resource is not comprehensive. The tools and services mentioned are recommendations reflecting available resources in the evolving telehealth landscape available at the time of publication.

Functionalities

We recommend the functional requirements for two types of telehealth encounters: basic and advanced encounters.

- Basic telehealth encounters include synchronous (or in real time) visits between patient and provider via audio or audio-visual communications. An example is a live, real-time visit with a primary care provider and a patient checking in on a chronic condition. The provider has an established care relationship with the patient and the patient has sufficient technology, sufficient internet access, and minimal to no language, cultural, or accessibility barriers.
- Advanced telehealth encounters include synchronous visits between patient and provider via audio or audio-visual communications that utilize advanced tools and resources to effectively care for the patient. Advanced encounters may include use of peripheral devices, such as physiologic monitoring tools and remote examination devices, either integrated into the electronic health record (EHR) or provided via third party platforms. Additionally, advanced encounters may include tools or resources that assist a patient who may not have sufficient technology, may not have sufficient internet access, and/or may have language, cultural, or accessibility barriers. An example is a live, real-time visit with a primary care provider and a patient during which the patient needs interpreting services to complete the visit. The use of video remote interpreting services classifies this as an advanced encounter. Tools and resources used in advanced encounters should be adapted to the patient's clinical condition and needs (i.e., hearing/visually impaired, translation services) with an understanding of patient characteristics and the functionalities of technology available to the patient. Providers and health care systems are advised to work closely with their information technology (IT) department (including IT security) and their EHR provider to understand the tools available to support telehealth clinical services in compliance with the Health Insurance Portability and Accountability Act (HIPAA).

Patient capabilities to use telehealth

When providing telehealth services, it is imperative to assess the patient's ability to use the range of digital health services provided. Health equity considerations are critically important. Research data published by the Pew Research Center, a nonpartisan fact tank, has shown that 25% of low-income adults (annual income <$30,000 year) do not own a smartphone, 40% of low-income adults do not have broadband or home computers, and in 2019, 13.4% of U.S. households reported no home internet subscription.[2] Thus, when implementing telehealth, a broad range of factors impact the success of a telehealth encounter. The use of an audio-only solution should always remain an option.

Basic telehealth encounters generally include an audio connection, a video connection, or both, which can support verbal reporting of symptoms and a visual examination of the patient conducted through either a patient portal or HIPAA-compliant stand-alone platform. Considerations include device access (including type of device, image resolution and configuration), cellular or broadband access at the patient originating site, patient digital literacy, and ability to consent to the encounter, and evaluate the clinical condition. Encounters should also offer technical assistance for patients and providers to troubleshoot issues; this can be supported via the provider organization, an outsourced vendor, or an on-site caregiver.

For advanced telehealth encounters, in addition to the considerations above, considerations also include a need for translation services and incorporating multiparty audio and video connections. Services offered to patients with low vision, patients who are deaf or hard of hearing, or patients with other disabilities must also be considered in the context of available tools and support services. For patients with limited data plans, considerations also include an efficient provision of adequate services without burdening the patient with excess costs. Patients may join telehealth encounters from a variety of locations, including cars or internet cafés; using personal devices; or from community centers, libraries, or telehealth kiosks at community locations using public devices. Considerations could also be made for the use of remote examination tools, other peripheral physiologic monitoring devices, and image capture.

In both basic and advanced telehealth encounters, patient privacy is imperative — both at the patient originating site to ensure privacy of the encounter and through the use of HIPAA-compliant technologies.

Recommendations

Recommendations for optimal patient accessibility have been made in the following categories: technical, device type, connectivity, and operating systems. Special considerations for institutions and programs are also included for institutional success. Lastly, based on the content delivered in the document, the AAMC has developed a checklist for getting started.

[2] Vogels EA. Digital divide persists even as Americans with lower incomes make gains in tech adoption. Pew Research Center. https://www.pewresearch.org/short-reads/2021/06/22/digital-divide-persists-even-as-americans-with-lower-incomes-make-gains-in-tech-adoption/. Published June 22, 2021.

Technical recommendations for basic telehealth visit encounters

The core technologies needed to conduct a basic telehealth encounter have become more ubiquitous and affordable in the last two decades. Below we describe some of the key components of a telehealth capable device or platform and the basic component recommendations platforms should meet (Table 1).

Table 1. Basic Component Recommendations for Platforms

Basic Component	*Description*	*Recommendations*

Screen	The telehealth device's screen facilitates communication, menu navigation, and information sharing between a patient and a care team member during a session.	• A Full HD (1920 x 1080p) screen capable of 30 fps (frames per second) video is adequate to provide optimal images.
		• Integrated, Touch, and External Screens:
		  ○ Screen types will vary depending on the device. Most mobile devices (smartphones and tablets) will have screens that integrate into the body of the device with the ability to use the touchscreen to control the device.
		  ○ Laptop devices will generally have integrated screens that may or may not support touch controls. Many desktops, carts, and kiosks support external screens (often referred to as monitors). These are less likely to have integrated touch controls (though some do) and will generally require a keyboard and mouse for control.

Webcam	The telehealth device's camera, often a webcam, captures video of the user and their surroundings during the session. This video is sent and shown to the other participant, enabling real-time interaction similar to video conferencing by allowing both parties to see and interact with each other. This combination to see and be seen provides the basis for real-time telehealth (and basic video conferencing) interactions.	• A Full HD webcam (1920 x 1080p) is generally recommended for most telehealth encounters. Lower resolution cameras (720p) can be used to good effect, but a higher resolution webcam will allow for a clearer image and, in some applications, may enable the provider to zoom in to relevant details.
		• Internal and External Cameras:
		  ○ Mobile devices (smartphones and tablets) will generally have at least one built-in camera. Generally, these cameras support resolutions and frame rates that are of more than sufficient quality for telehealth use cases.
		  ○ Most laptops will also have a built-in webcam; however, these are often not of sufficient quality and resolution for good telehealth use. If necessary, an external USB webcam can be used to provide adequate image quality.

Microphones and Speakers	Microphones capture audio while speakers play back the sound for the participant at the opposite end, ensuring both parties can understand the communicated information. These components are crucial for effective communication in telehealth encounters.	• Audio quality should be of sufficient quality that each participant's speech is clear and understood. This level of quality will vary by participant and can be highly affected by the environment. Participants should not have to struggle to hear or make themselves heard when speaking at a conversational volume.
		• Internal Speakers: The built-in internal speakers of mobile devices (smartphones and tablets) and laptops may or may not be of adequate quality for telehealth visits. There is significant variability in speaker quality between device manufacturers and between models of devices. Whenever possible, testing should be done to make sure that sound produced from internal speakers is of adequate volume, quality, and clarity to be useful in a telehealth application.
		• External Devices: Many consumer devices exist that can help improve the quality of audio provided in a telehealth encounter. These generally fall into three broad categories:
		  ○ Webcam Microphones: Many webcams will have built-in microphones. These will generally provide better audio quality than built-in microphones on laptops and mobile devices.
		  ○ Headsets: Designed to capture and reproduce audio for a single participant, these types of devices are useful when privacy is a concern or when background and environmental noise may be an issue. These devices generally consist of one or two earpieces and a built-in microphone, often on a boom that can be positioned in front of the mouth.
		  ○ Speaker/Microphone Pods: Devices that combine both a microphone and speaker into a single device can provide good audio for multiple participants in a room with a minimal amount of setup.

Technical recommendations for advanced telehealth visit encounters

In addition to basic video conferencing, other telehealth components and technologies exist that can enable more advanced telehealth encounters (Table 2).

Table 2. Advanced Component Recommendations for Platforms

Advanced Component	*Description*	*Recommendations*
Telehealth Peripherals	Using these technologies may often demand some proficiency from the patient, yet they contribute valuable insights to a telehealth encounter. Two widely used telehealth peripherals are highlighted in the Recommendations column.	• Digital Stethoscopes: A variety of digital stethoscopes allow distant providers to listen to heart, lung, and bowel sounds either via live streaming of stethoscope sounds, or through recorded sound files that can be reviewed asynchronously. • Advanced Cameras: Exam cameras provide a way for the distant provider to get a closer view of their patients. Working in the same way as a USB webcam, switching to an advanced exam camera can be as simple as switching from the webcam to the exam camera. Many cameras will have interchangeable lenses to provide other functionality, such as otoscope or dermascope. Others only provide a general exam capability.
Dedicated Internet Access Point	These devices function similarly to compact routers or hotspots, leveraging cellular networks to provide internet access. They are mobile access points that use cellular data connectivity purchased from one, or potentially several, cellular carriers and convert it into a local Wi-Fi network that can be used by a variety of devices.[3] This technology can be adaptable for remote providers in temporary clinic spaces or can be provided	

[3] Holslin P. What is Mi-Fi? Here's what you need to know about portable internet. HighSpeedInternet.com. https://www.highspeedinternet.com/resources/what-is-mifi#:~:text=A%20MiFi%20device%20is%20a,Novatel%20in%20the%20late%202000s. Published July 10, 2023.

	directly to the patient. Dedicated Internet Access Point units can be flexible (if potentially expensive) in creating reliable connectivity.	
Telehealth Software	Telehealth application software supports diverse telehealth applications, ranging from general telehealth services to specific applications focused on a particular specialty or patient need. These technologies facilitate the collection, transmission, and analysis of telehealth data either synchronously or asynchronously. A notable distinction among these platforms is their integration with an organization's EHR.	• EHR-integrated: These applications are built into existing EHR systems or have the ability to exchange information with the system. • Stand-alone: These are applications and software that exist outside of the EHR and have no ability to interact with an EHR.
Telehealth Enhancements for Patient Evaluation and Monitoring	The Recommendations column highlights several common telehealth services that enhance capabilities through live video visits, or as an independent program or service.	• Remote Patient Monitoring (RPM): RPM systems allow patients to submit vital sign readings for review by care providers. The ability to track patient readings over time and look for elevated or critical values is a benefit. If a concerning trend is detected, intervention can take place before a negative outcome occurs. • Remote Exam: These technologies provide the ability to allow providers and potentially patients themselves to capture and transmit telehealth information to a care provider. This transmission can either occur synchronously or asynchronously. Common remote exam tools include exam cameras, otoscopes, vitals sensors (heart rate, Spo2, and temperature), and even echocardiogram. • Store and Forward Consultation: There are a variety of software, applications, and peripherals that are designed to capture images and other biomedical information and securely transmit this information to a specialist for asynchronous review. These solutions may or may not integrate with an organization's EHR.

Device type recommendations

In this section we discuss some of the common types of devices used in basic and more advanced telehealth applications. Device recommendations should be considered general guidance. The device requirements for telehealth services may change over time. Assessment of current devices supported by your organization and leveraging existing or familiar devices that could also be used for telehealth applications can be useful in reducing the IT, financial, and support demands of your telehealth program.

The minimum hardware requirements needed to perform telehealth are too varied by device, platform, software, and application to accurately address here. Telehealth hardware and software manufacturers should disclose the minimum hardware and system requirements needed to operate their software or technology. The best practice is to exceed those requirements whenever possible to ensure your technology will be able to support future technologies as they become available.

Devices like smartphones and tablets have the primary advantages of being more affordable, accessible, and mobile than the other device types. If, for example, you are trying to connect with a patient in their home, it may be possible that they already have a phone or tablet that can support a video call and likely are connected to their home wireless internet or a cellular data plan. When engaging in a telehealth visit via a patient mobile device, it is important to recognize the type of device and the key features and potential challenges (Table 3).

Table 3. Mobile Device Type, Key Features, and Considerations

Mobile Device	*Key Features*	*Considerations*
Smartphones	• Can be connected to cellular and wireless networks. • Integrated audio and video (cameras, microphones, and speakers). • Easy to access software through app stores. • Peripheral support through Bluetooth connectivity.	• Using Patient Internet and Data Plans: Use of patient cellular data or consumer internet networks can be problematic due to potential data costs incurred by the patient as well as lack of control over the speed or quality of networks. • Single User Devices: Due to their small screen size and the limited range of integrated audio configured settings, most smartphones can generally support only a single user at a time. • Fewer Ports: Smartphones often lack the input/output (I/O) options you might find on other device types and generally do not support common USB-type peripherals. • Privacy Concerns: The mobile nature of smartphones can create issues if users are not making efforts to find appropriate locations for protected conversations.
Tablets	• Most tablets will connect to wireless networks, but	• Privacy Concerns: The mobile nature of tablets can create issues if users are not

	some can be equipped with cellular data plans. • Integrated audio and video (cameras, microphones, and speakers). • Tablets generally support larger screens than most smartphones. • Easy to access software through app stores. • Peripheral support through Bluetooth connectivity. • I/O options are generally more robust than smartphones.	making efforts to find appropriate locations for protected conversations. • Using Patient Internet and Data Plans: Tablets also may use cellular data or consumer internet networks that can be problematic due to potential data costs incurred by the patient, as well as lack of control over the speed or quality. • Single User Devices: Due to the size or limited range of integrated audio configuration, tablets can generally support only a single user at a time.
Personal Computers — Laptops	• Built-in screens and keyboards. • Many have built-in webcam and audio. • Wireless connectivity. • USB peripheral support. • Battery or integrated power plugs. • Support more I/O options.	• Expense: More expensive than tablets or smartphones. • Variance: Can have a variety of build quality, features, and support. • Setup and Installation: Setup and software installation can be more involved. • Privacy Concerns: Mobility may generate privacy issues.
Personal Computers — Desktops	• Generally support wireless and wired internet connectivity. • Support more I/O options. • Can output higher resolution image quality to larger monitors or televisions (depending on device). • Battery or integrated power plugs.	• Expense: Can be more expensive than other device options depending on features. • Equipment Needs: Immobile platform requiring screens, keyboards, and other peripherals to operate. • Variance: Can have a variety of build quality, features, and support. • Setup and Installation: Setup and software installation can be more involved. • Time and Digital Literacy Concerns: Setup and software installation can be more involved.

Telehealth Cart With Computing Device (PC or Tablet) on a Wheeled Chassis	• Battery or integrated power plugs. • Provides a more stable video experience and more security for devices housed inside. • For PC carts, a screen and keyboard secured to a wheeled cart chassis. • Many carts can be customized to support telehealth peripherals like exam cameras, stethoscopes, or other telehealth peripherals.	• Expense: Telehealth carts can be expensive to purchase over and above the cost of their computing units (tablet or PC). • Storage Requirements: Unused carts will need to be stored and secured when not in use. • Setup and Upgrades: Depending on the cart there could be substantial work involved in setting up and deploying the unit. Due to the secure nature of the carts, it can be challenging to upgrade the unit to new technology when program requirements change.
Telehealth Kiosks	• Often feature a touch screen for navigating installed menus and settings. • Many kiosk providers provide a white label option for organizations to match organizational branding. • Simplified operation based on kiosk workflow design.	• Expense: Like carts, kiosks can be expensive to deploy. • Lack of Flexibility: If operational needs change, it can be challenging to repurpose kiosks to new workflows.

Operating system recommendations

Telehealth technologies can utilize a variety of different underlying operating systems (OSs). Often telehealth technology can support multiple OS environments or can be used across different OS environments (for example, a person on an Apple smartphone can have a telehealth visit with a provider on a Windows laptop). Since OSs can differ depending on the device used during an encounter, it is important to familiarize oneself with the most common operating platforms on telehealth devices (Table 4).

Table 4. Common Operating Platforms on Telehealth Devices

Telehealth Devices	*Operating Platform*
Mobile Devices	• iOS/iPadOS: The OSs of Apple mobile devices. Because Apple creates both the hardware and operating system for their devices, there is less variability in how iOS/iPadOS devices function. Often the version of iOS/iPadOS supported by a device is the limiting factor in which applications the user will be able to run. • Android: The OS for nearly all non-Apple devices. Because Android is used by a variety of mobile device manufacturers, there is a high amount of variability between Android devices and how they function. Like iOS, the version of Android software supported by a device can be the main limiting factor in which applications the user will be able to run.

Desktop/Laptop Devices	• Most desktop/laptop computers will run on one of the OSs listed below. When selecting a telehealth device, it is important to know which OS you will need to support and whether the telehealth software and applications you want to use are supported by that OS.
	• Most organizations' IT departments will be familiar with supporting and deploying software in at least one of the OS environments. Working within the technology environment your organization is familiar with can be useful in avoiding challenges in deploying telehealth technology.
	• Common OSs include:
	  ○ Windows
	  ○ MAC/OS
	  ○ Linux
	  ○ Android
	  ○ Chrome OS

Connectivity

Connectivity is crucial for telehealth devices, encompassing the methods and technologies used to connect devices and users to the internet. This section will cover minimal connectivity recommendation, the technologies enabling this connectivity, and additional connectivity considerations for implementing telehealth technologies.

For optimal multiparty video conferencing, a minimum connection speed of 5Mbps for downloads and 2Mbps for uploads is recommended. Known as minimal connectivity, this should be sufficient for live video visits with several participants. However, as video platform capabilities expand, this minimum may become outdated.

Connectivity can differ depending on the device being used. Mobile devices, for example, use cellular connectivity via cell towers. Cellular technology evolving across generations (e.g., third generation is referred to as 3G) has the advantage of wireless access and being widely accessible wherever there is cell

tower coverage. A wide variety of factors including the strength of the tower signal, the sensitivity and quality of the device antenna, obstructions and buildings, and landforms (like valleys or hills) can impact cellular coverage. Cellular connection can also depend on subscription by the patient to a cellular network subscriber (e.g., AT&T, TMobile, or Verizon) or prepaid data services (i.e., data cards). Cellular networks can also become congested when there are multiple users accessing the same tower. Here is a breakdown of common cellular technologies and their average speeds (higher download speeds are recommended for advanced telehealth encounters):

- 3G — Download speeds up to around 8Mbps.
- 4G — Download speeds ranging from 15-100Mbps.
- 5G — Download speeds of 150-200Mbps.

Desktop and laptop devices utilize broadband internet. Broadband describes high speed internet that is faster than dial-up and does not need to be connected (i.e., it is always on). The current federal definition of broadband describes a connection with minimum download speeds of 25Mbps and minimum upload speeds of 3Mbps, which is effective for basic encounters.[4] For advanced telehealth encounters, higher download speeds and upload speeds are recommended. Broadband internet connection can depend on subscription by the patient to an internet provider (e.g., Xfinity). Below are some of the technologies that support broadband internet:

- Digital Subscriber Lines (DSLs) use existing telephone lines to deliver connectivity. Actual speeds delivered will vary by internet service provider (ISP) but should be fast enough for video telehealth visits.
- Cable modems deliver the internet via coaxial cable like cable television. Cable modem speeds will vary by ISP and plan, but in general will be faster than DSL.
- Fiber uses small strands of glass fibers to transmit data using pulses of light. Fiber can produce very fast internet speeds and is often used in conjunction with cable to provide connectivity to a neighborhood or community.
- Satellites have long been a method for delivering connectivity in areas not served by terrestrial (ground-based) infrastructure. Using satellites orbiting the earth, an ISP can provide connectivity in very rural areas. Satellite internet has a history of being expensive, being subject to interference from weather, and having high levels of latency (delay between when a signal is sent and when it is received). However, new technologies like Low Earth Orbit satellite constellations are making satellite internet a much more attractive proposition for organizations and consumers.
- Wireless (Wi-Fi) routers can convert broadband internet into a Wi-Fi network using radio signals. This network can be accessed by devices with a wireless receiver without having to plug into the modem. Wireless networks can provide connectivity across a home or facility. Wireless networks can be sensitive to interference from other radio sources, but assuming a strong initial broadband connection and a strong wireless signal, these Wi-Fi routers can provide more than enough throughput for telehealth applications.

[4] National Telecommunications and Information Administration. BroadbandUSA. (n.d.). https://broadbandusa.ntia.doc.gov/

Depending on the use case and the needs of a patient population it may be useful for a third-party organization to have a program to provide or locate adequate broadband for patient care. Below are some examples of program provided connectivity solutions.

- Dedicated Internet Access Points are generally small devices that can convert cellular connectivity into wireless broadband. Organizations can deploy these to a patient home or to a clinical provider traveling between patient locations. In areas where cellular connections may be problematic there are options for Dedicated Internet Access Point units that support multiple cellular carriers. Dedicated Internet Access Points can be a flexible way to provide connectivity where broadband connections do not exist. Monthly costs for Dedicated Internet Access Point units can be expensive to maintain.
- Alternative Access Points: Many programs are creating or partnering with community stakeholders to create locations that provide broadband access. Some locations, called Telehealth Access Points (TAPs), have dedicated rooms and telehealth capable devices as well. These resources provide access critical access for those who may not otherwise be able to participate in telehealth. TAPs may be located in:
    - Libraries.
    - Community centers.
    - Clinic parking lots.
    - Post offices.

In an effort to promote digital inclusion, it is important to consider barriers related to patient connectivity. There are three areas of consideration for every patient population: access, cost, and quality. First, many communities in the United States are still underserved by broadband, making access to connectivity services a barrier.[5] Second, many of the connectivity services require costly subscriptions or data cards that offer sufficient speed to participate in telehealth. Additionally, many plans have data caps that limit how much internet a subscriber can use, or data throttling practices that severely limit the internet speeds a subscriber can access once a set amount of data has been used. Lastly, communities suffer from oversubscribed (too many users at one time) or unreliable internet infrastructure resulting in video or audio quality issues. Resources mentioned above, like dedicated access points or data cards, should be made available to patients as needed to mitigate these barriers to care.

Other program and institutional considerations

Whether a large integrated health care system, hospital, private practice, clinic, or direct to consumer company, a diverse range of factors must be considered in the development and implementation of a telehealth program/service.

[5] Federal Communications Commission. *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended.* Washington, DC: Federal Communications Commission; 2012. https://www.fcc.gov/document/progress-made-broadband-deployment-availability-gaps-remain-0

Technology choices must take into consideration the full range of patient and institutional capabilities. The patient's capabilities should reflect their available digital resources and the needs of their community, cultural barriers, language, etc., to ensure equitable access to care.

There are several institutional considerations for technology choices, including telehealth applications that integrate into the EHR and the use of a patient portal (e.g., MyChart) versus a HIPAA-compliant stand-alone solution. Many EHR providers have lists of telehealth solutions with predeveloped integration. Patient portal solutions with patient user logins that integrate directly into the EHR can help standardize workflows and training among providers and patients. Lastly, patient portals may provide the ability to send secure telehealth appointment links directly to patients with easy to access video portals. Being able to send a secure message to patients with a link to join their video appointment can simplify patient access to visits, workflows for providers, and make the experience easier to navigate for the patient.

To ensure that telehealth services are accessible for patients with disabilities, adopting a human-centered design approach is essential. Many health care organizations offer resources to support the design and implementation of models that cater to diverse patient needs. Key aspects of this approach include testing audio and video integration services and checking upload and download speeds before appointments. Additionally, leveraging patient support services can enhance the effectiveness of each encounter.

Special efforts must also be made to accommodate patients with limited English proficiency. Most health care organizations have access to comprehensive interpreter services. Testing of audio and video for an interpreter is an important consideration in providing services to all patients via telehealth. Ensuring workflows to support seamless integration into telehealth services is essential for patient access.

Conclusion

The investment of an integrated health care system, hospital, private practice, clinic, or direct-to-consumer company in a telehealth program/service is a significant investment. Any program should consider these recommendations to ensure equitable access to telehealth care.

Recommendations for getting started

- **Identify targeted populations requiring additional support.** Communities are multidimensional. Are there any target populations that will need additional connectivity, devices, or digital literacy support?
- **Consider focus groups with the intended target population to validate needs and gaps.** Incorporating the patient voice into your programming can help to validate population needs and gaps that may not appear in your surveys or assessments. Focus groups can also help to identify pilot populations and track patient engagement.
- **Partner with community/stakeholders working in digital inclusion.** Community organizations or stakeholders may already be working to promote digital inclusion in your catchment area population. Consider reaching out to establish partnerships and streamline service.
- **Identify federal, state, and payer requirements.** Payment and reimbursement for telehealth services can differ by federal, state, and payer levels. Take inventory of what requirements exist in the state you plan to establish services. The Center for Connected Health Policy can help to identify these requirements.
- **Investigate best practices from similar organizational use cases.** Are there other programs you would like to model your program after? Running a literature review can help to identify programs. The AAMC is committed to funding innovative programs that address the needs of underrepresented communities using telehealth through AAMC's Telehealth Equity Catalyst Awards. Consider looking there for like programs and reaching out to telehealth@aamc.org.
- **Survey/assess catchment area population telehealth needs and define device, connectivity, and platform gaps.** Assess the digital connectivity capabilities of your community. Does your population lack access to devices? Consider reaching out to IT to see if your institution has available devices. Does your population need resources for connectivity? Consider purchasing a dedicated internet access point or partnering with local sites.
- **Assess existing telehealth capabilities.** Reaching out to key departments within your organization can help to scale and implement your telehealth strategies. Key areas within your organization to consider are IT, an interpreter or interpretation service provider, a compliance department, a quality department, a privacy and security department, a legal team, your EMR/EHR provider, etc.
- **Define device/platform data gaps within the organization and assess resources required to fill gaps (e.g. devices, IT support, staff resources, training, organizational support, funding, etc.).** Do you have the devices or platforms to service your patients? This may include investing in new technologies, such as webcam-enabled devices. For advanced telehealth encounters, organizations should tabulate what additional devices may be needed, such as RPM devices (pulse oximeters) or diagnostic tools (digital thermometers or otoscopes). What funding resources do you need for implementation and scaling? Who will help when devices stop working?

- **Identify partners in government and community organizations with telehealth policy priorities.** Strategic partnership with national, local, and community organizations can help to address policy priorities related to telehealth. Consider reviewing the AAMC Policy and Regulatory - Telehealth Website and reaching out to regulations@aamc.org.
- **Test devices with individuals from the target population.** Engage with your population to determine usability of your devices. This helps to troubleshoot and develop solutions prior to the start of a telehealth visit.
- **Set up processes for same-day visit success.** Ensure a process for self-test of patient technology available within platform. Require resources and ensure technical support is available to troubleshoot technology programs. Develop digital literacy training for patients.

Resources

Resources from government and advocacy organizations that provide devices and digital access as a service to communities that are underserved with limited access to technology.

- Telehealth Virtual Resource Center (Maryland Health Care Commission)
- Telemedicine for Health Equity: Considerations for Leadership Before Implementing Telemedicine (Center for Care Innovations)
- Recommendations on digital interventions for health system strengthening (World Health Organization)
- Rolling Exams: Workstations on Wheels Make Hybrid Consultations Easy (Center for Care Innovations)
- Revised 508 Standards and 255 Guidelines (U.S. Access Board) — standards all federal agencies must follow regarding access to information and communication technology.
- 18F Accessibility Guide (GSA Technology Transformation Services) — for websites and apps, includes tools to check design for accessibility.
- Web Content Accessibility Guidelines (WCAG) 2 Overview (W3C Web Accessibility Initiative) — website design accessibility guidelines.
- Telemedicine During the Pandemic: Leaving the Visually Impaired and Others With Disabilities Behind? (Health Affairs)
- Guidance on Web Accessibility and the ADA (U.S. Department of Justice Civil Rights Division) — examples of web design that limit access to people with disabilities (e.g. lack of captions on videos, mouse-only navigation, poor contrast, relying on color to express information, etc.)
- Guidance on Nondiscrimination in Telehealth: Federal Protections to Ensure Accessibility to People With Disabilities and Limited English Proficient Persons (U.S. Department of Health and Human Services)
- How Can We Help? (National Digital Equity Center) and Create A Local Broadband Benefit Program (National Digital Equity Center) — an organization, based in Maine, focused on training and initiatives around digital equity that offers a broadband benefit program.
- T-Base Blog: Simplifying Accessible Communications (T-Base Communications)