Telepsychiatry Practice: Technological Considerations

Nicole Gloff, MD, and the Telepsychiatry Committee

Programs using telemental health (TMH) to deliver mental health services directly to children and families are developing rapidly. Many institutions are pushing for the use of communications technology in mental health service provision for all ages. Fortunately, there has been a decrease in the cost of video teleconferencing (VTC) systems over the past decade, which allows for greater acceptability and feasibility of such programs (Chou et al. 2015). In this second article, the AACAP Telepsychiatry Committee presents key technological considerations for a telepsychiatry practice.

When implementing a TMH program, an important step is to select the appropriate technology for the services being provided. The chosen technology should be appropriate to the clinical setting and the model of care. Quality of service, reach, and accessibility need to be balanced with the costs of purchasing equipment, training clinicians, and necessary technical support (Chou et al. 2015).

Video Teleconferencing (VTC) Software Applications/Platforms. There are two basic applications/platforms that are available to use in telepsychiatry. These include standards-based applications and consumer-grade applications.

- Standards-based. Standards-based platforms, sometimes referred to as “legacy hardware,” allow for secure point-to-point transmission of high bandwidth (≥ 1.5 mbps), high-definition video and audio signals using satellite or fiber optic systems. Data are transmitted over digital subscriber lines (DSL). Typical DSL broadband capacities are often small (< 12 mbps); however, this speed is guaranteed at all times as these systems use a static IP address, which ensures a stable image (Roth webpage). They provide excellent telepresence. A limitation to standards-based systems is that they are relatively immobile and require technical expertise/IT support to set-up and maintain, thus making them impractical for use in the home and in clinics with few supports (Chou et al. 2015). Additionally, they are associated with a higher overall cost, which may be limiting in certain settings.

- Consumer-grade. Consumer-grade platforms allow for VTC over the Internet using software that encrypts the transmission. Subscriptions to these platforms are sold based on the number of users/accounts and the software can be readily loaded onto personal computers, tablets, and smartphones (Chou et al. 2015; Roth webpage). This is also known as cloud-based computing. Accessing the software usually involves downloading an application or utilizing a link to a website to join a session. Major advantages to consumer-grade platforms are that they are easily accessible, adaptable, consumer friendly, and available at a lower cost. They can be installed wherever broadband is available. Limitations include a highly variable connection speed, which can be affected by factors such as high local Internet traffic, inclement weather, and network failures. This ultimately impacts the quality of streaming audio and video (Roth webpage). Additionally, these systems generally do not allow for the addition of external features such as a remote stethoscope or camera that is operated by the provider site.

Future technological innovations may overcome this limitation in the future. Despite these potential limitations, consumer-grade platforms are considered acceptable for clinical work and widely used.

- Network Connection. Bandwidth is the rate at which data is transmitted over an online connection. Video teleconferencing can require large amounts of bandwidth to operate smoothly, without breaks in audio or video transmission (Chou et al., 2015). The general guideline is for a VTC platform to have the ability to operate at a bandwidth of 384 Kbps or higher (Myers, Cain 2008; Yellowlees et al. 2010). Having a seamless network connection allows the telepsychiatrist to observe subtleties in a child’s speech, facial expression, and movements. It also allows the provider to respond fluidly to the child and family during a session. This is important for effective expression of empathy and emotional tone (Glueck 2013).

- Video. Display resolution and screen size can impact the telepsychiatrist’s ability to adequately observe a child during a TMH visit. High definition displays allow for transmission of a crisp image as long as the bandwidth is great enough to support this. It is optimal to have a frame rate of 30 frames per second. There is no guideline as to the appropriate size of the display, so the clinician must consider the patient population and resolution to make this determination (Chou et al. 2015).

A camera with pan-tilt-zoom functionality is considered to be the gold standard in TMH (Chou et al. 2015; Glueck 2013; Myers, Cain 2008; Yellowlees et al. 2010). However, this capability may not be possible with consumer-grade applications (Gloff 2015). Pan-tilt-zoom functionality allows for close examination of the child and the ability to follow his or her movements throughout the exam room. Zooming in allows for closer examination of facial expression,
a VTC system for a TMH practice. Technological advances continue to occur and providers and institutions must stay current. It is important to choose VTC technology that is appropriate to the clinical service, financially sustainable, and matches the available technical support at the patient site. Appropriate technology selection and implementation ensure the quality and security of TMH care for children and their families.

**References**


American Telemedicine Association: [www.americantelemed.org](http://www.americantelemed.org)


Telehealth Resource Center: [www.telehealthresourcecenter.org](http://www.telehealthresourcecenter.org)

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- **Audio.** Some clinicians consider having crisp seamless audio during a TMH visit to be even more important than a strong video signal, thus it is important to use an appropriate microphone (with the correct placement) during a TMH visit (Chou et al. 2015; Roth webpage) It is generally recommended that TMH visits utilize audio at 7 kHz full duplex with echo cancellation (eliminates room return audio echo) and the ability to mute and adjust volume (Yellowlees et al. 2010).

- **Privacy.** Privacy is an important issue in TMH and decisions regarding the selection of VTC equipment should be made with patient confidentiality, privacy, and security in mind (Chou et al. 2015). Institutions should ensure that their VTC systems and data storage are in compliance with the Health Information Portability and Accountability Act (HIPAA) (Chou et al. 2015; Myers, Cain 2008; Roth webpage; Yellowlees et al. 2010). Encryption alone does not ensure compatibility with the HIPAA. Software vendors with platforms that are HIPAA compliant have signed a Business Associate Agreement (BAA) attesting that they are in compliance with HIPAA. This is particularly important to investigate prior to purchasing a consumer-based platform, as some do not meet HIPAA standards.

- **Technical support.** The level of IT support required to install and maintain a VTC system within an institution largely depends upon the complexity of the system, resources available at both the patient and provider site, and the abilities and availability of existing administrative and technical staff in troubleshooting potential issues. Prompt IT support may reduce the number of TMH sessions that fail to occur or are prematurely terminated due to equipment failures (Chou et al. 2015). In addition to having adequate IT support, it is also useful to have brief provider trainings in order to familiarize clinicians with the VTC equipment and ways to quickly troubleshoot issues. If technical difficulties occur, it is important to have a back-up plan in place, e.g., telephone, in order to complete a session if deemed appropriate (Myers, Cain, 2008). Additionally, when negotiating with a cloud-based vendor, it is important to ask about their typical response time and the services provided by their company to assist with troubleshooting technical difficulties. This can vary widely between vendors.

There are several considerations to be made regarding the purchase, installation, and ongoing maintenance of