

## Home-based clinical video teleconferencing care: Clinical considerations and future directions

Leslie A. Morland<sup>a</sup>, Jeffrey M. Poizner<sup>a</sup>, Kathryn E. Williams<sup>a</sup>, Tonya T. Masino<sup>a</sup> & Steven R. Thorp<sup>a,b,c</sup>

<sup>a</sup>Department of Veterans Affairs, San Diego Healthcare System, California; <sup>b</sup>Center of Excellence for Stress and Mental Health, San Diego, California; <sup>c</sup>Department of Psychiatry, University of California, San Diego, USA

### ABSTRACT

Clinical video teleconferencing (CVT) is a treatment delivery modality that can be used to provide services to clinical populations that experience barriers to accessing mental health care. Recently, home-based CVT (HBCVT) has been developed in order to deliver treatment via CVT to patients in their homes. A number of clinical considerations, including the appropriate clinical population and individual patient factors, need to be taken into account when delivering CVT. Particular challenges can exist when setting up the home environment for HBCVT. Concerns about maintaining patient privacy while living in shared spaces, ensuring adequate CVT technology in the patient's home, and conducting risk management remotely are important to consider when delivering treatment via CVT. Since treatments delivered via CVT are often conducted across state lines, novel ethical and legal issues such as privacy laws, licensing of providers, prescribing practices, and insurance reimbursements need to be addressed when conducting services via these modalities. Future research on HBCVT will provide researchers and clinicians with information regarding which patients are most appropriate for treatment delivered via this modality and help further develop evidence for the cost-effectiveness of CVT and HBCVT clinical practice guidelines.

### ARTICLE HISTORY

Received 6 July 2015  
Accepted 10 August 2015  
Published online  
26 November 2015

### KEYWORDS

Telemedicine, videoconferencing, home-based, psychotherapy, pharmacotherapy

### Introduction

Mental health conditions affect a large number of people and are a leading cause of disability worldwide; however, many individuals suffering from mental illnesses do not receive care (Demyttenaere et al., 2004; World Health Organization, 2001). Individuals in need of mental health treatment often encounter various barriers when attempting to access these services (New Freedom Commission Mental Health, 2004). A substantial proportion of individuals living in rural or remote areas face critical geographically-based barriers involving distance or travel time to the nearest treatment facility when accessing specialist care (Hoge et al., 2004). Logistic barriers include transportation issues (including the availability of transportation and fuel and maintenance costs) and challenges in obtaining childcare or time off from work or school schedules. There are also agency-level barriers to accessing care, most notably the shortage of qualified specialists in non-metropolitan areas. These obstacles contribute to lower rates of mental health treatment service acquisition, engagement, and retention, particularly in rural settings (Lyons, 2003). It is essential to identify and implement means for addressing these barriers to be responsive to the mental health care needs of all citizens.

Clinical video teleconferencing (CVT) is a treatment delivery modality that has the potential to provide services to individuals in need of health care that might not otherwise be able to access these services. CVT technology is often used to enhance or expand the reach of clinician-delivered psychotherapy. CVT allows for real-time, interactive, face-to-face communication between clinicians and psychotherapists located in different locations via a television, computer monitor, or mobile device screen. Mental health treatment delivered by CVT has been extensively studied for both individual and group treatment formats and has become progressively more available in a variety of service systems. CVT has been used extensively for providing psychiatry services as well (De Las Cuevas et al., 2006; Grady & Singleton, 2011; Hyler et al., 2005; O'Reilly et al., 2007; Shore, 2013; Yeung et al., 2009).

Studies have indicated that CVT can achieve comparable clinical outcomes to in-person delivery across various therapies with diverse patient populations (Backhaus et al., 2012). Randomized clinical trials (RCTs) have demonstrated that post-traumatic stress disorder (PTSD) outcomes with CVT delivery of trauma-focused therapies are generally comparable to outcomes

associated with traditional service delivery methods. These specific RCTs often employ a non-inferiority methodological approach to show that the effect of a new treatment (in this case the CVT modality) is not worse than an established control condition (in this case the traditional in-person modality). A recent RCT conducted with veterans with PTSD confirmed the non-inferiority of using CVT to deliver an evidence-based treatment (EBT) for PTSD, cognitive processing therapy (CPT) (Resick et al., 2007), relative to CPT delivered in person (Morland et al., 2014). Another recent RCT (Fortney et al., 2015) found that a collaborative care model, which included treatment with CPT, medication, case management, and psychiatric consultations, delivered via telehealth produced larger reductions in PTSD symptoms compared to outcomes found in the treatment-as-usual condition. This approach enhanced treatment engagement and increased access to and delivery of EBTS relative to usual care. A pilot study of prolonged exposure (PE) (Foa et al., 2007) delivered via CVT to 12 US veterans with PTSD showed significant decreases in clinical outcomes and provided support for the feasibility and safety of exposure-based treatments delivered via CVT (Tuerk et al., 2010).

Patients using CVT technology have shown high degrees of patient and clinician satisfaction (Frueh et al., 2000) and rates of attendance (Greene et al., 2010) comparable to in-person care in other CVT studies. Furthermore, research investigating therapist effects in CVT indicates that therapist adherence (Morland et al., 2011), therapist competence, and therapist fidelity when delivering manualized treatment protocols is similar in CVT and in-person modalities (Frueh et al., 2007).

Typically, CVT is office-based through specialized equipment, with therapists located at a large facility and patients located at a more remote satellite clinic. However, due to broader access to improved technology there has been movement into home-based CVT (HBCVT). Based on positive results for office-based CVT, there is growing interest regarding whether CVT can be used to safely and effectively deliver PTSD therapies to patients in their own homes to improve access to care; however, there have also been reservations about home-based (HB) care (sometimes referred to as 'clinically unsupervised settings').

A number of ongoing trials of HBCVT for veterans with PTSD are underway. Yuen and colleagues (2015) reported the preliminary results of a RCT of PE for combat-related PTSD, which provided evidence that clinical outcomes and patient satisfaction were similar between the HBCVT and in-person conditions. Another ongoing trial is assessing HBCVT delivery of an exposure

therapy for co-occurring PTSD and depression in veterans. Preliminary results demonstrated significant reductions in symptoms of PTSD, depression, and anxiety in both the HBCVT and in-person conditions (Strachan et al., 2012). Future large scale RCTs on PTSD treatments delivered via various telehealth modalities (e.g. HBCVT, online, apps) are warranted.

HBCVT has also been used to deliver telepsychiatry services to patients in their homes (Whitten & Kuwahara, 2004). The Department of Veterans Affairs (VA) has used HBCVT to provide care to American Indian veterans in their homes in remote reservation communities for PTSD and co-morbid behavioural or medical conditions (Shore et al., 2008). Much of the 'home-based' research on psychiatry services has focused on older adults in nursing home care. One study examined how eight Chinese immigrants in a nursing home would respond to follow-up visits via CVT (Yeung et al., 2009). Despite the fact that the participants were 54 years old or older and some had symptoms of dementia or psychosis, the six participants who were referred for treatment via CVT responded well and there were reports of high satisfaction from residents, families, and nursing staff. Similarly, in a study of 106 nursing home residents (Rabinowitz et al., 2010), there was successful patient management and high satisfaction among residents, family, and staff. Moreover, the researchers found savings of more than 800 h, 43,000 miles (~69,200 km), and tens of thousands of dollars compared to traditional face-to-face treatment. Another study of CVT for 45 older nursing home residents (Tang et al., 2001) found again that this modality was feasible, acceptable to residents and staff, and cost-effective. Johnston and Jones (2001) also reported success in using CVT for telepsychiatry consultation services for 40 residents of a nursing facility in a rural setting, concluding that it enabled prompt and frequent responses to patients' needs and efficient use of the consultant's time. Further research investigating the delivery of services via CVT and HBCVT to diverse clinical populations across various treatment settings would continue to provide information regarding the specific considerations that both providers and patients need to take into account when conducting treatment via telehealth modalities.

## Clinical considerations

### *For whom is HBCVT appropriate?*

The use of CVT has expanded significantly in the past decade. CVT has improved access to quality mental health care for diverse populations, including those in underserved or rural areas, prisons, and nursing home

**Table 1.** Patients who are appropriate for home-based CVT.

| Patient characteristics |   |
|-------------------------|---|
| 1.                      | Mobility issues due to disability or age-related factors  |
| 2.                      | Transportation issues, unable to drive, or difficulty affording car or high cost of fuel  |
| 3.                      | Busy work, school and family schedules that make seeking in-person, office-based treatment too difficult (weekly psychotherapy session or regular, brief psychiatry visits) |
| 4.                      | Those concerned about privacy or the negative stigma of going into a mental health clinic   |
| 5.                      | Those whose very condition impairs treatment seeking such as highly anxious and avoidant patients or those with trauma-related disorders, anxiety or agoraphobia            |
| 6.                      | Behavioural issues that pose a risk to providers or others, such as aggression or history of sexual assault   |
| 7.                      | Those requiring specialist care in areas where it is not readily available due to provider shortage   |

CVT, clinical video teleconferencing.

residents. The VA has developed robust telehealth programmes in an effort to improve access and provide care to more veterans, particularly in rural areas or areas where provider shortages limit delivery of care. CVT has the potential to dramatically further the reach of mental health services available to the population at large, and it can be widely used for most mental health conditions with most patients (see Backhaus et al., 2012). Assessment and treatment via CVT has been reported for a number of mental health conditions including depression, bipolar disorder, panic disorder, PTSD, eating disorders, ADHD and schizophrenia.

The use of HBCVT allows patients access to care where it would be otherwise difficult or impossible, as HBCVT allows the care provider (psychiatrist or therapist) to be present in the patient's home. HBCVT can be a good treatment option for highly anxious and avoidant patients, such as those suffering from trauma-related disorders who might otherwise not seek care (Backhaus et al., 2012). Some patients with PTSD, panic disorder, or phobias (such as bridges or driving phobias) may be unable to drive to appointments. Some clinics have used HBCVT to reach patients who have exhibited significant behavioural issues in the clinic or hospital setting, or those with 'behavioural flags', who may be more safely and comfortably managed in their own home environment. Table 1 shows examples of special patient populations who may specifically benefit from home-based mental health care through CVT.

Rather than thinking in terms of diagnoses, it is perhaps more useful to consider individual patient factors when determining which patients are most appropriate for HBCVT. It is important for patients to be both agreeable and able to utilize CVT technology. Some familiarization and comfort with technology is useful, though many patients who are less technology

savvy have learned to adequately manage Internet-based CVT software. Patients who are initially hesitant to consider care via CVT often become comfortable quickly and go on to report improved satisfaction with home-based care, given the convenience and ease of use. For example, a study conducted with combat veterans with PTSD delivered exposure-based treatment via CVT and found that familiarity with and confidence in the CVT technology at baseline was unrelated to clinical outcomes (Price & Gros, 2014).

Patients in very remote areas may experience connectivity issues that make sessions difficult, especially for longer and more frequent psychotherapy visits. Patients need to be patient and flexible enough to help problem-solve any technical difficulties that might arise. In addition, patients and providers should agree during the informed consent process on procedures and options for alternative services if home-based care needs to be suspended due to either clinic or logistical considerations.

More research is needed to determine which individuals and populations can be best served using HBCVT. As the technology improves and its adoption grows, it is likely to become more widely used and accepted as a mainstream health delivery modality. The utility and feasibility of HBCVT is limited in individuals with moderate to severe cognitive difficulties or sensory impairment (such as severe hearing loss). HBCVT can be helpful for substance use treatment maintenance in stable patients; however, those with ongoing severe substance use disorders should be monitored due to the potential for intoxication, decreased inhibition and impaired judgement. Patients with impaired reality testing, severely psychotic or paranoid individuals, those with poor impulse control, uncontrolled anger or self-injurious tendencies may be more appropriate for office-based CVT or face-to-face care. However, a review of the literature on the use of CVT for treatment and assessment with individuals with psychotic disorders has found evidence that this modality is equivalent to in-person services and is tolerated and well-accepted without producing an exacerbation in symptoms among these patients (Sharp et al., 2011). Finally, those with serious active suicidal or homicidal ideation may be best served where providers could more adequately intervene to provide emergency services. Table 2 provides some guidelines regarding potential exclusion criteria for HBCVT. The guidelines provided in Table 2 are initial recommendations, and thus the context of each individual patient's clinical and home situation needs to be taken into account when determining whether a particular patient is appropriate for HBCVT.

**Table 2.** Patients who may not be appropriate for home-based CVT.

| Patient characteristics |  |
|-------------------------|--|
| 1.                      | No access to personal computer device with camera and/or broadband access or those unwilling or unable to utilize video camera and Internet-based technology |
| 2.                      | Initially reject telehealth in the informed consent process  |
| 3.                      | Severe psychosis, paranoia, or impaired reality testing  |
| 4.                      | Poor impulse control or severe mood dysregulation  |
| 5.                      | Active suicidal or homicidal tendencies  |
| 6.                      | Active/severe substance use disorder or intoxication   |
| 7.                      | Severe cognitive impairment  |
| 8.                      | Severe sensory impairment(s)   |

CVT, clinical video teleconferencing.

### Therapist considerations

Clinician training should not only include training in the in the treatment that is being provided but also in the home based CVT modality procedures. Clinician competence when providing services via CVT includes the thorough assessment of dangerousness, effective decision-making regarding psychiatric hospitalization, and knowledge of the steps to take during medical emergencies and when encountering resistant patients. The provision of pharmacy and prescription services, laboratory procedures, and referral sources are also complicated during CVT. Information concerning US pharmacy services is provided in the Ryan Haight Online Pharmacy Consumer Protection Act (2008), which specifies whether an initial face-to-face visit is required by law when clinicians are prescribing controlled substances via CVT. This initial visit in person is especially important with home-based CVT, though it may be conducted by the therapist or support staff.

In order to provide therapy via CVT, the clinician must become familiar with basic equipment to facilitate effective connection and communication (Lozano et al., 2015). The standard equipment included in a standard CVT unit comes with a video camera, internal speakers, and a microphone. CVT units can be operated using a desktop or laptop computer located in the clinician's office or through a CVT system placed in a conference room. Researchers have noted the importance of logistical issues for the successful delivery of services via CVT, including preparing the room and technological equipment, providing stationary chairs to reduce excessive body movement, and optimizing lighting (Morland et al., 2003). The quality of the screen image is affected by the lighting in the room. In order to minimize shadows it is best to close window blinds and to utilize diffuse fluorescent lighting. Lighting can also cast a glare on white boards, therefore making it difficult to see written material. In such cases it may be necessary to tilt the camera or change the lighting. A simple décor is ideal for

CVT. An uncluttered, neutral (non-white) background is preferred for each person to see the other via CVT. Neutral (non-white), solid colours are best for clothing as well. Bright colours and patterns can present excessive visual contrast through a CVT unit.

For a one-on-one therapy session, chair placement should be directly facing the CVT equipment. Eye contact is best if each person is seated 6–8 feet (~2–2.4 m) from the camera with the camera zoomed in to show the person's head and shoulders. In a group setting, the chairs should be situated in a semi-circle, where patients are able to see one another and the CVT screen. Depending on the type of group therapy treatment, a table can be helpful, with the semicircle forming around the table. Once the room is arranged, the clinician can easily utilize the pre-set functions on the CVT system on his/her side. Ultimately, addressing logistical issues will help minimize any real or perceived effect of distance and maximize effective communication in order to approximate an in-person clinical experience.

### Setting up the home environment

Although many of the steps taken to set up an environment conducive for HBCVT may seem intuitive, we have found that it works best to assist patients in cultivating their 'clinical space' by offering several guidelines. A primary consideration involves privacy, so providers should help their patients strategize in advance to create a space in which privacy can be ensured for the entire duration of the session. It is important that rooms be free of disruptions (e.g., children entering the room or knocking on the door to ask routine questions) and ideally allow conversations that are not audible to people in other rooms. In our experience, it is not uncommon for patients to be less concerned about their privacy than providers, and patients may even state that they do not mind if their partner or other family member overhears the session. Providers should remind patients that the goal is to offer the same level of privacy and confidentiality that they would have in the provider's office and be clear that this is an expectation for HBCVT. Since patients often share their living space with others, it is also worthwhile to help them create a plan early in treatment for when others in the home have a schedule change that impacts the delivery of HBCVT. For example, if a patient's family member or room-mate stays home sick or has a change in his or her work schedule, can privacy still be ensured during the session? By considering their options and discussing this matter with others in the home prior to when it occurs, patients often are able to still meet without disruption or sacrificing their privacy.

In addition to privacy, providers should consider the nature of the treatment being offered when helping patients set up their HBCVT environment. As an example, one of the authors of this article treated a young male combat veteran with PE for PTSD via HBCVT. As he lived in a smaller home with his family of origin, the sessions initially occurred in his bedroom, which was the only private space available and he sat on his bed as there were no chairs or other comfortable places for him in that space. He used the same location to review his 'imaginal exposure' recordings daily between sessions. He began describing that his bedroom felt like a 'prison' and stated that he had begun to associate his bed with the review of stressful material. He ultimately reported an increase in difficulties sleeping. This arrangement may be clinically inadvisable from a 'stimulus control' (SC) perspective (Bootzin et al., 1991) and in treatments such as cognitive behavioural therapy for insomnia (CBT-I) that implement SC as a behavioural component of treatment (Manber et al., 2014). In this specific case, the situation was remedied when the patient arranged with his family to have privacy in the entire home for his weekly sessions, which he then accessed from his living room.

The home environment often seems to push the limits of traditional therapeutic boundaries. Patients frequently are eager to share more of their lives with their providers by introducing them to partners, children, and pets. They often invite providers to remotely access their living space in ways that typically are not possible from traditional office-based visits. Thus, while some providers are concerned that the remote nature of telehealth visits will negatively impact the therapeutic relationship, there may be factors in HBCVT that enhance it. Family members and others in the home can communicate collaborative information to providers and assist patients with meeting treatment goals. Many patients have indicated that they benefited from this involvement of loved ones in CVT and would not have had such involvement in a traditional clinic.

Since patients are in their personal space during sessions, we have also found variability in how they present. Some patients dress in an overly casual manner/way, etc to HBCVT sessions, such as wearing pyjamas. We have found it helpful to send a handout to prospective HBCVT patients in advance with basic guidelines, such as: 'During session please do not smoke, chew tobacco, eat, or prepare food. Please dress the way you would if meeting with your provider in an office.' We developed our specific guidelines based on events that actually occurred during session. One patient had sessions during his lunch break and several times would prepare his lunch and eat while the session was beginning. After discussion,

the patient agreed this behaviour was not the best use of his therapy time. Another patient was smoking from a hookah during session, but the provider could not initially see it due to low lighting and pixilation. Again, this was discussed and the patient was reminded to consider behaviour in appointments to be the same as it would be in clinic-based appointments.

### *Setting up HBCVT technology*

It is important that both the provider and the patient take steps to maximize the call quality by setting up the technology appropriately in their respective locations. On the patient side, the essential technology required is a computer or tablet with a camera and access to high speed Internet. We have had many patients state that they have high speed Internet, but then attempt to use their cell phones during the first session to create a 'hotspot' for wireless Internet or log in via public WiFi (which aside from confidentiality concerns is not usually fast enough to support HBCVT sessions). This is unreliable and often does not result in acceptable connectivity levels. We have had several instances where patients have called in from restaurants, coffee shops, public libraries (not in a private room), and their cars.

Further, patients should be instructed in advance to sign out of all programs such as e-mail, social media, and instant messaging prior to the session in order to minimize both distractions and competition for bandwidth. Providers will often need to remind patients of this at the beginning of a session to minimize disruptions from visual and sound cues that could distract the patient as well as reduce call quality. Having patients move closer to the router can also help if there is a poor connection.

Clinicians should be aware of the entire view from a patient's perspective, including the background. Reducing visual stimuli in the background is advisable, as less data will be required to transmit the image, which can help with call quality. Before initiating treatment, we routinely conduct a 'test call', which is a brief, non-clinical encounter to test the equipment and call quality. Rather than promising in advance that HBCVT can be offered, we use this as an opportunity to better determine whether HBCVT is a viable and appropriate option for each patient.

### *Managing risk remotely*

Preparing a risk management plan for home-based mental health treatment is essential for providers prior to engaging in these services with patients. For many

providers this can be one of the most anxiety-laden factors of HBCVT and this anxiety could deter them from providing services via CVT to patients in their homes. Risk management protocols can be completed as part of the informed consent. After initial phone contact, a packet of information that must be returned prior to the first treatment session is sent out to each patient. This packet contains the written informed consent, the risk management protocol, and other treatment information. The risk management protocol is then discussed with the patient prior to the first session. Careful preparation of protocols prior to initiation of services can reduce this anxiety, as providers realize the protocol is similar to what they would follow if they were seeing a patient through traditional in-person office based care. In addition, the provider determines the clinical appropriateness of the patient prior to the individual being seen in their home through the information gathered from the assessment protocol and use of a test call to ensure that the CVT equipment works properly.

The risk management protocol includes a review of the patient's presenting problem and background that includes their history of suicidal ideation and/or attempts, homicidal ideation/attempts, psychiatric hospitalizations, and current substance use. In addition, the protocol asks patients to verify the address and telephone number where the sessions will be occurring and identify other individuals who will be in the home or location during the sessions. An additional safety measure that is recommended, but not necessary, is to have a patient complete a release of information for a primary support person. This person could be notified in case of emergency and could even help if emergency procedures are implemented during a session.

Upon determination of suitability for services, a provider will create an emergency contact document that includes patient information and session location information, including (1) name, (2) telephone numbers, (3) address, and (4) primary support person contact information (if utilized). The provider is responsible for determining telephone numbers for law enforcement and emergency services in the patient's location. This can be done by completing a web-based search of the patient's address and nearest police or sheriff's department. After this is determined, the provider may contact law enforcement to verify the correct telephone numbers to use. It is important to note that this is a safety protocol only and personal information about the patient should not be shared when determining the correct contact information for law enforcement. In smaller communities there may only be one law enforcement department, which makes verification simpler. In larger cities where various departments handle different jurisdictions

this process can be more time consuming. Many law enforcement agencies in larger communities have departments that primarily respond to psychiatric emergencies and this can be helpful information to include with a risk assessment plan.

It is important to discuss the emergency plan protocol with a patient prior to the first session, as well as during ongoing sessions, to normalize procedures and make modifications as necessary (e.g., new address of location, new primary support person). If an emergency arises during the session, the provider will follow the established protocol. The provider will inform the patient of the need to implement safety procedures, if possible, and will contact local law enforcement or emergency response to meet the patient's needs. If a primary support person is identified and the release of information is completed, the provider may also contact that individual to assist them in being present with the patient (if possible) or inform them that the patient is being transferred to an emergency location (often a hospital in the area). The provider will stay with the patient via CVT until transport to safety has occurred. Preparation for this will ease anxiety on the part of both the provider and patient should an emergency occur.

### *Legal and ethical considerations*

US federal and state laws regarding licensing of providers, treatment across state lines, prescribing practices, and patient privacy must be carefully considered in the ethical practice of mental health care delivery via HBCVT. Reimbursement by insurance companies for clinical services provided via CVT varies. Some states have parity laws which require insurance companies to reimburse telehealth providers at the same rate as traditional in-person office based care encounters for comparable services. Most states and the District of Columbia provide some Medicaid reimbursement for telehealth services (Center for Connected Health Policy, 2014). HBCVT is not covered by insurance companies as often as clinic to clinic telehealth; however, patients may be willing to pay out of pocket for the added convenience of receiving treatment in their own homes. Providers must ensure that the delivery of mental health services to home-based patients via CVT is compliant with Health Insurance Portability and Accountability Act privacy laws and that organizational policies are in place to protect patients' electronic health records and data. Laws relating to licensing requirements vary across state lines. While efforts are being made to allow for interstate practices in telemedicine, in general providers must be licensed both in the state where they reside and any states where patients reside. This does not apply to

providers in the VA Healthcare System, which allows providers licensed in any state to treat veterans in any state, including across state lines via HBCVT.

In psychiatry, special consideration should be given to the prescribing of controlled substances when patients are managed via home-based care. The ease and convenience with which patients can connect with their physicians from home could increase the likelihood that patients seeking controlled substances will try to access care this way. As we have noted, current federal law prohibits the prescribing of controlled substances via the Internet without a traditional in-person office based evaluation as part of a medical evaluation. However, several exceptions to this exist for telemedicine practitioners, such as when patients are located in a Drug Enforcement Agency registered facility (Ryan Haight Online Pharmacy Consumer Protection Act, 2008). The law requires the same standard of care for telemedicine as in-person assessments, but in North Carolina the Medical Board specifically states that, “The evaluation need not be in person if the licensee employs technology sufficient to accurately diagnose and treat the patient in conformity with the applicable standard of care.” (North Carolina Medical Board, 2015). Given these concerns, our programme currently requires at least one traditional in-person visit/appointment (office-based visit) for patients who are prescribed controlled substances, and in most cases patients are established in face-to-face clinics and then transitioned later to home-based care with the same provider.

### **Conclusions and future directions**

As we have noted, CVT is evolving to be a core element of public health interventions. There is a solid research base supporting use of CVT to deliver EBTs to clinic offices. These technologies offer a path toward improving the efficiency and effectiveness of interventions. CVT has been shown to maintain excellent clinical outcomes while enabling mental health professionals to serve greater numbers of patients. This means that we can connect our well-validated treatments with patients who would not otherwise have access. CVT has the potential to benefit individuals who are often disadvantaged in terms of mental health care: those in rural settings, older adults, and racial or ethnic minorities.

Recent advances in cellular technology allow for the possibility for cell phones and tablet computers to be used to deliver CVT, as any modality that can provide visual as well as auditory connection has the potential to be a feasible modality of care. However, the encryption of the cellular connection used for CVT needs to first be determined in order to ensure the safety of the patient and

confidentiality during treatment. In addition, the reliability of the cell phone connection needs to be established before CVT treatment using these devices. Over time, CVT services may be available over cell phones or tablets using video chatting (e.g. FaceTime, Skype). Large treatment facilities tend to require a certain encryption packet in order to protect the patient’s confidentiality during CVT, which telecommunications conducted via cell phones and tablets do not always provide. Thus, although it is technically possible to conduct CVT over cell phones and tablets, the lack of information security on these devices may not meet clinical standards.

Data are emerging to support HBCVT as an alternative to traditional in-person office-based care. In addition to allowing patients a convenient modality of treatment, HBCVT allows providers to see into patients’ homes. As CVT becomes more mobile with improvements in technology, patients will be able to show providers more of their homes and neighbourhoods. This will convey information about lifestyle, safety, potential disruptions, cleanliness, and resources in a way that traditional in-person office-based treatment cannot replicate. For example, a patient can show a provider the medications in his or her medicine cabinet, take the provider on a tour of an apartment, or even walk around the block so that the provider can determine whether an assignment for exposure therapy in the local environment is appropriate and safe. Given the anticipated spread of home-based technologies around the world in the next decade or so, this modality could make a significant contribution to reducing the global burden of mental health problems.

There is a need for larger clinical trials of HBCVT, including non-inferiority trials that can help determine whether HBCVT is as good as traditional office-based care. Such trials can help determine whether the mode of treatment offered by HBCVT is more appropriate for some individuals than others. For example, it is possible that age, gender, cognitive ability, or technological comfort could influence outcomes in HBCVT trials. It may also be determined that HBCVT is a better fit for some clinical populations relative to others.

Data from trials will be invaluable as best practice guidelines emerge for HBCVT. Data will also help guide insurance companies and healthcare systems as they determine which modes of treatment to recommend, and which modes of treatment will be reimbursed. There will continue to be broader clarification of legal issues as states grapple with the implications of less expensive and more accessible means of providing mental healthcare services. Mental health problems are associated with great personal and societal costs. CVT has the potential

to help reduce those costs by taking effective treatments home.

**Declaration of interest:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

## References

- Backhaus, A., Agha, Z., Maglione, M.L., Repp, A., Ross, B., Zuest, D., .. Thorp, S.R. (2012). Videoconferencing psychotherapy: A systematic review. *Psychological Services, 9*, 111–131.
- Bootzin, R.R., Epstein, D., & Wood, J.M. (1991). Stimulus control instructions. In P. Hauri (Ed.), *Case studies in insomnia* (pp. 19?28). New York: Plenum Press.
- Center for Connected Health Policy. (2014). *State telehealth policies and reimbursement schedules: A comprehensive plan of the 50 states and District of Columbia*. National Telehealth Policy Resource Center. Retrieved from <http://cchpca.org/sites/default/files/uploader/50%20STATE%20MEDICAID%20REPORT%20SEPT%202014.pdf>
- De Las Cuevas, C., Arrendondo, T., Cabrera, F., Sulzenbacher, H., & Meise, U. (2006). Randomized clinical trial of telepsychiatry through videoconference versus face-to-face conventional psychiatric treatment. *Telemedicine and e-Health, 12*, 341–350.
- Demyttenaere, K., Bruffaerts, R., Posada-Villa, J., Gasquet, I., Kovess, V., Lepine, J.P., .. Chatterji, S. (2004). Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization world mental health surveys. *Journal of the American Medical Association, 291*, 2581–2590.
- Foa, E.B., Hembree, E.A., & Rothbaum, B.O. (2007). *Prolonged exposure therapy for PTSD: Emotional processing of traumatic experiences, therapist guide*. New York: Oxford University Press.
- Fortney, J.C., Pyne, J.M., Kimbrell, T.A., Hudson, T.J., Robinson, D.E., Schneider, R., .. Schnurr, P.P. (2015). Telemedicine-based collaborative care for posttraumatic stress disorder: A randomized clinical trial. *JAMA Psychiatry, 72*, 58–67.
- Frueh, B.C., Deitsch, S.E., Santos, A.B., Gold, P.B., Johnson, M.R., Meisler, N., .. Ballenger, J.C. (2000). Procedural and methodological issues in telepsychiatry research and program development. *Psychiatric Services, 51*, 1522–1527.
- Frueh, B.C., Monnier, J., Grubaugh, A.L., Elhai, J.D., Yim, E., & Knapp, R. (2007). Therapist adherence and competence with manualized cognitive-behavioral therapy for PTSD delivered via videoconferencing technology. *Behavior Modification, 31*, 856–866.
- Greene, C.J., Morland, L.A., Macdonald, A., Frueh, B.C., Grubbs, K.M., & Rosen, C.S. (2010). How does tele-mental health affect group therapy process? Secondary analysis of a noninferiority trial. *Journal of Consulting and Clinical Psychology, 78*, 746–750.
- Grady, B., & Singleton, M. (2011). Telepsychiatry ‘coverage’ to a rural inpatient psychiatric unit. *Telemedicine and e-Health, 17*, 603–608.
- Hoge, C.W., Castro, C.A., Messer, S.C., McGurk, D., Cotting, D.I., & Koffman, R.L. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *New England Journal of Medicine, 351*, 13–22.
- Hyler, S.E., Gangure, D.P., & Batchelder, S.T. (2005). Can telepsychiatry replace in-person psychiatric assessments? A review and meta-analysis of comparison studies. *CNS Spectrums, 10*, 403–413.
- Johnston, D., & Jones, B.N. (2001). Telepsychiatry consultations to a rural nursing facility: A 2-year experience. *Journal of Geriatric Psychiatry and Neurology, 14*, 72–75.
- Lozano, B.E., Hynes Birks, A., Kloezeman, K., Cha, N., Morland, L.A., & Tuerk, P.W. (2015). Therapeutic alliance in clinical videoconferencing: Optimizing the communication context. In P. Tuerk & P. Shore (Eds), *Clinical videoconferencing in telehealth: Program development and practice* (pp. 221?251). New York: Springer.
- Lyons, J.A. (2003). Veterans Health Administration: Reducing barriers to access. In B.H. Stamm (Ed.), *Rural behavioral health care: An interdisciplinary guide* (pp. 217?229). Washington, DC: American Psychological Association.
- Manber, R., Friedman, L., Siebern, A.T., Carney, C., Edinger, J., Epstein, D., ... Karlin, B.E. (2014). *Cognitive behavioral therapy for insomnia in veterans: Therapist manual*. Washington, DC: U.S. Department of Veterans Affairs.
- Morland, L.A., Frueh, B.C., Pierce, K., & Miyahira, S. (2003). PTSD and telemental health: Updates and future directions. *NCPTSD Clinical Quarterly, 12*, 1–5.
- Morland, L.A., Greene, C.J., Grubbs, K.M., Kloezeman, K., Mackintosh, M., Rosen, C., & Frueh, B.C. (2011). Therapist adherence to manualized cognitive-behavioral therapy for anger management delivered to veterans with PTSD via videoteleconferencing. *Journal of Clinical Psychology, 67*, 629–638.
- Morland, L.A., Mackintosh, M.A., Greene, C.J., Rosen, C.S., Chard, K.M., Resick, P., & Frueh, B.C. (2014). Cognitive processing therapy for posttraumatic stress disorder delivered to rural veterans via telemental health: A randomized noninferiority clinical trial. *Journal of Clinical Psychiatry, 75*, 470–476.
- New Freedom Commission on Mental Health. (2004). *Achieving the promise: Transforming mental health care in America*. Washington, DC: Author.
- North Carolina Medical Board. 2015. Telemedicine position statement Retrieved from <http://www.ncmedboard.org/resources-information/professional-resources/publications/forum-newsletter/article/telemedicine-position-statement>.
- O’Reilly, R., Bishop, J., Maddox, K., Hutchinson, L., Fisman, M., & Takhar, J. (2007). Is telepsychiatry equivalent to face-to-face psychiatry? Results from a randomized controlled equivalence trial. *Psychiatric Services, 58*, 836–843.
- Price, M., & Gros, D.F. (2014). Examination of prior experiences with telehealth and comfort with telehealth technology as a moderator of treatment response for PTSD and depression in veterans. *International Journal of Psychiatry in Medicine, 48*, 57–67.
- Rabinowitz, T., Murphy, K., Amour, J.L., Ricci, M.A., Caputo, M.P., & Newhouse, P.A. (2010). Benefits of a telepsychiatry consultation service for rural nursing home residents. *Telemedicine and e-Health, 16*, 34–40.
- Resick, P.A., Monson, C.M., & Chard, K.M. (2007). *Cognitive processing therapy treatment manual: Veteran/military version*. Boston, MA: Veterans Administration.

- Ryan Haight Online Pharmacy Consumer Protection Act. (2008). H.R. 6353, 110th Congress. Retrieved from <http://www.govtrack.us/congress/bills/110/hr6353>.
- Sharp, I.R., Kobak, K.A., & Osman, D.A. (2011). The use of videoconferencing with patients with psychosis: A review of the literature. *Annals of General Psychiatry, 10*, 14.
- Shore, J. (2013). Telepsychiatry: Videoconferencing in the delivery of psychiatric care. *Psychiatric Services, 170*, 256–262.
- Shore, J.H., Brooks, E., & Novins, D. (2008). In-home monitoring for American Indian Veterans with posttraumatic stress disorder. *Telemedicine and e-Health, 14*, 77.
- Strachan, M., Gros, D.F., Ruggiero, K.J., Lejuez, C.W., & Acierno, R. (2012). An integrated approach to delivering exposure-based treatment for symptoms of PTSD and depression in OIF/OEF veterans: Preliminary findings. *Behavior Therapy, 43*, 560–569.
- Tang, W.K., Chiu, H., Woo, J., Hjelm, M., & Hui, E. (2001). Telepsychiatry in psychogeriatric service: A pilot study. *International Journal of Geriatric Psychiatry, 16*, 88–93.
- Tuerk, P.W., Yoder, M., Ruggiero, K.J., Gros, D.E., & Acierno, R. (2010). A pilot study of prolonged exposure therapy for posttraumatic stress disorder delivered via telehealth technology. *Journal of Traumatic Stress, 23*, 116–123.
- Whitten, P., & Kuwahara, E. (2004). A multi-phase telepsychiatry programme in Michigan: Organizational factors affecting utilization and user perceptions. *Journal of Telemedicine and Telecare, 10*, 254–261.
- World Health Organization. (2001). The World Health Report 2001–Mental health: New understanding, new hope. Geneva, Switzerland: World Health Organization. Retrieved from <http://www.who.int/whr/2001/en/>
- Yeung, A., Johnson, D.P., Trinh, N.H., Weng, W.C., Kvedar, J., & Fava, M. (2009). Feasibility and effectiveness of telepsychiatry services for Chinese immigrants in a nursing home. *Telemedicine Journal and E-Health, 15*, 336–341.
- Yuen, E.K., Gros, D.F., Price, M., Zeigler, S., Tuerk, P.W., Foa, E.B., & Acierno, R. (2015). Randomized controlled trial of home-based telehealth versus in-person prolonged exposure for combat-related PTSD in veterans: Preliminary results. *Journal of Clinical Psychology, 71*, 500–512.

Copyright of International Review of Psychiatry is the property of Routledge and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.