

A TREATMENT IMPROVEMENT PROTOCOL

Using Technology-Based Therapeutic Tools in Behavioral Health Services

TIP 60



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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Substance Abuse and Mental Health Services Administration
Center for Substance Abuse Treatment

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Part 1, Chapter 1

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Introduction

Digital media and resources, such as email, smartphone/tablet applications (apps), online forums, Web sites, DVDs, CD-ROMs, blogs, computer software, online social networks, telephone and televideo communication, and mobile devices are becoming universal in our culture. The use of electronic media and information technologies in behavioral health treatment, recovery support, and prevention programs is rapidly gaining acceptance. Technology-based assessments and interventions are important therapeutic tools that clinicians can integrate into their work with clients. Additionally, technology allows alternative models of care to be offered to clients with specific needs that limit their ability to participate or interest in participating in more conventional interventions targeting behavioral health. Technology-assisted care (TAC) can transcend geographic boundaries to reach many people otherwise unable to access services and is useful in a wide variety of settings, including Web-based interventions offered in the home, community organizations, schools, emergency rooms, and healthcare providers' offices, as well as via mobile devices and online social networks. Furthermore, TAC is often accessible on demand at the user's convenience, thus reducing barriers to accessing care.

As of 2014, 87 percent of the population used the Internet (Pew Research Center [PRC], 2014), and only 7 percent of those who did not use the Internet lacked access to it (PRC, 2013). In 2012, 72 percent of Internet users reported seeking health information online (PRC, 2013). This represents a substantial increase from 2009, when only 61 percent of adults reported looking for health information online (Jones & Fox, 2009). Moreover, 90 percent of people now own a cell phone (PRC, 2014) and 64 percent own a smartphone (PRC, 2015); of those with a smartphone, 62 percent reported having used it to acquire some type of health-related information (PRC, 2015). The number of adults who have an

account with an online social network increased from 8 percent in 2005 to 46 percent in 2009 (Lenhart, 2009c). Currently, 74 percent of adults who use the Internet use a social networking site, with 89 percent of those ages 18 to 29 and 82 percent of those ages 30 to 49 reporting use (Duggan et al., 2015). As a result of these considerable increases in overall online access, TAC could potentially have a significant impact on public health. Major strides have already been made in the promotion and use of telemedicine, including tele-behavioral health.

The rapid growth of these resources requires a carefully planned response by treatment and prevention programs targeting behavioral health. In addition to relevant staff development and training, this response needs to address the specific electronic resources applicable to each program, the contexts in which those resources will be most useful, the benefits and risks of using them, the methods for preparing clients to accept and use these resources, and an organizational commitment to evaluating the effectiveness and utility of specific technologies. New technologies represent new means of communication; messages must be tailored to the technology and the issues at hand. For example, an email message will most likely need to be different from a text message. Use of advanced technologies also requires consideration of a number of legal and ethical issues, such as confidentiality, scope of practice, state licensure regulations, privacy, data security, consent management, and the potential for misuse.

Goal and Scope of This TIP

This Treatment Improvement Protocol (TIP) provides an overview of current technology-based assessments and interventions (including treatment, recovery support, relapse prevention, and prevention-focused interventions) targeting behavioral health, and

it summarizes the evidence base supporting the effectiveness of such interventions. It also examines opportunities for TAC in the behavioral health arena—particularly in improving early access to care, client engagement in and commitment to treatment and recovery, client education, specific treatment interventions, relapse prevention and recovery management, extended recovery, community engagement, mental health promotion, and substance use disorder prevention, among other areas. This TIP addresses how behavioral health service providers can use Web sites, telephone and televideo resources, smartphones, and other portable devices and electronic media for education, outreach, and direct client services. It emphasizes use of TAC with clients who might not otherwise receive treatment or whose treatment might be impeded by physical disabilities, rural or remote geographic locations, lack of transportation, employment constraints, or symptoms of mental illness. This TIP emphasizes the use of TAC with those who might not seek treatment in conventional settings and/or who have personal preferences that limit access to conventional services.

It is definitely not the intent of this TIP to suggest that electronic media should replace in-person client contact. Instead, this TIP focuses on how TAC, when incorporated into mental and substance use disorder treatment and prevention efforts, can supplement existing methods and also provide services to clients who might not otherwise receive this help. It is also not the intent of this TIP to promote any particular technology-based therapeutic tools or any of the companies that develop or host these tools, but rather, to broadly highlight the promise of TAC by providing specific examples. This TIP does not explicitly address how use of TAC in behavioral health service delivery intersects with changing healthcare laws in the United States, but it does suggest that TAC may significantly increase

the quality of care delivered and the success of integrating behavioral healthcare with disease prevention and management.

In short, evidence-based TAC has the potential to reach more clients and help engage and retain them in services in a cost-effective manner. This TIP provides treatment and prevention workers in the behavioral health arena with the resources they need to use various technologies in their practice and to recognize the limits and ethical considerations involved in using them. It also provides behavioral health program administrators with the information they need to integrate and expand the use of technologies in their systems of care.

Principles for Using Technology-Based Therapeutic Tools

The content of this TIP was developed with continual input from a consensus panel of behavioral health clinicians, behavioral health program administrators, and federal agencies with significant experience, expertise, or interest in the provision of TAC in the behavioral health arena. The panel identified several key principles to guide TAC in behavioral health services. These principles provide overall guidance for the use of any type of electronic media or information technology targeting behavioral health, and as such, all sections of this TIP align with these overarching principles (Exhibit 1.1-1).

The Potential Utility of Technology-Based Therapeutic Tools

Technology-based assessments and interventions are of use in a variety of ways, and they may also be clinically meaningful along an entire spectrum of behavioral health services, including screening, assessment, prevention, treatment, recovery management, and con-

tinuing care. The use of technology, such as a computer or a mobile device, in screening for and assessing individuals' behavioral health needs may allow for the efficient, standardized, and cost-effective collection of clinically relevant client information in diverse settings. This can be particularly important in healthcare settings where clinicians trained in behavioral health assessment procedures are not readily available and where opportunities to identify individuals who may benefit from behavioral health interventions are missed. TAC gives clients access to screening, intervention, and oversight by trained behavioral

Exhibit 1.1-1: Principles To Guide TAC in the Behavioral Health Arena

The following key principles guide TAC in the behavioral health arena. All sections of this TIP were developed to align with these principles:

- Clinical judgment is fundamental and should drive decisions regarding the use of technology. Clinical judgment, and not merely the existence of a given technology, should guide the application of said technology in clinical contexts.
- Practitioners should use technological solutions only within their realm of professional competence and scope of practice.
- The way technology-based tools are used may differ across populations and settings.
- Clinicians and clients should thoughtfully consider and discuss the risks and benefits of technology-based tools as part of the therapeutic process.
- Technology can offer value for individuals and their families along the entire spectrum of behavioral health services. This may include screening, assessment, prevention, treatment, recovery management, and continuing care.
- Maintaining security and confidentiality in TAC is the responsibility of all parties engaged in such care.
- Clinicians, clients, and other stakeholders should continually work together to shape, maintain, and refine models for the adoption and use of technology-based therapeutic tools in treatment.

It's Not About the Technology

New technologies, such as telehealth, help improve healthcare services. For technology to succeed in doing so, it must work for the people it is meant to help; it must aid not only clients, but also the professionals providing their care. Telehealth helps ensure that clients who are veterans get the right care in the right place at the right time. It aims to make the home the preferred place of care whenever possible.

Source: U.S. Department of Veterans Affairs (VA) Telehealth Services (<http://www.telehealth.va.gov>)

health staff members in remote locations. Brief computerized screenings can identify individuals with varying levels and types of behavioral health needs and can identify the differing resources and services that may be helpful to them. These brief screenings may also be useful as a less intensive therapeutic option for individuals not willing to seek professional care actively at a given point in time.

TAC allows behavioral health service providers and their clients to communicate directly at the same time (synchronously) or at separate times (asynchronously). For instance, distance counseling approaches in which clients and clinicians interact in real time online or by phone exemplify synchronous communication, whereas text-based communication (e.g., text messaging, emails) between a clinician and client may be asynchronous; one sends a message, but the other may not reply until later. This chapter discusses technology-based therapeutic tools that fall in both general categories and may be integrated into treatment and prevention activities.

Technology-based interventions targeting behavioral health may be used as “clinician extenders,” or additional tools used by clinicians that can also be made available to clients (Bickel, Marsch, & Budney, 2013; Carroll &

Rounsaville, 2010; Marsch, 2011b). For example, distance counseling approaches may fill a treatment gap for those who cannot readily access care in their local communities: individuals in rural or remote settings, people who are unable to commute to behavioral health service providers’ offices, and/or people uninterested in traditional service delivery models. Additionally, by offering TAC to clients (e.g., encouraging clients to complete online skills training modules), clinicians may increase their time availability for clients with multiple challenges; focus more of their time on the delivery of services that require their clinical expertise and interaction with clients; and enable clients to review repetitive but clinically important content, such as psychoeducational material, without having to devote extensive time to such activities themselves.

E-therapeutic tools can also serve as clinician extenders by helping clinicians work with a larger number of clients and/or for longer periods of time (e.g., online counseling offered as relapse prevention after a more intensive treatment episode), which allows them to have a greater impact with their service delivery. When used in this manner, TAC offers great potential for extending the benefits of treatment as well as allowing clients to access care when they need it the most. Time flexibility is another potential benefit of TAC, particularly through incorporation of technologies that enable asynchronous communication between clinicians and clients—making services available on demand at times that are convenient for clients. As a result, TAC allows widespread access to therapeutic support, thereby creating unprecedented models of intervention delivery and reducing barriers to accessing care.

The anonymity afforded by TAC (e.g., when conducted via online anonymous support groups) may be appealing to individuals when addressing sensitive topics such as substance

use and other risky behaviors (Des Jarlais et al., 1999; Ramo, Hall, & Prochaska, 2011). Anonymity, however, can also be a problem for behavioral health clinicians. It can create legal and ethical issues when there is no informed consent, when reportable use issues arise, when clients potentially pose a danger to themselves or others, and when the counselor can't verify whether the client lives in a state or region where the counselor is licensed, among a variety of other circumstances.

When information technology is used to deliver behavioral health interventions, new information can be incorporated easily and exported quickly. This is particularly true for Web- or mobile-based TAC, because updates in program content can be incorporated centrally and made available to all end users at the same time. Thus, TAC has the potential to offer the latest scientific advances in behavioral health services rapidly and continuously. TAC facilitates linkages to services and support systems in the community through:

- Online resources or decision support systems to help individuals make choices about their own care.

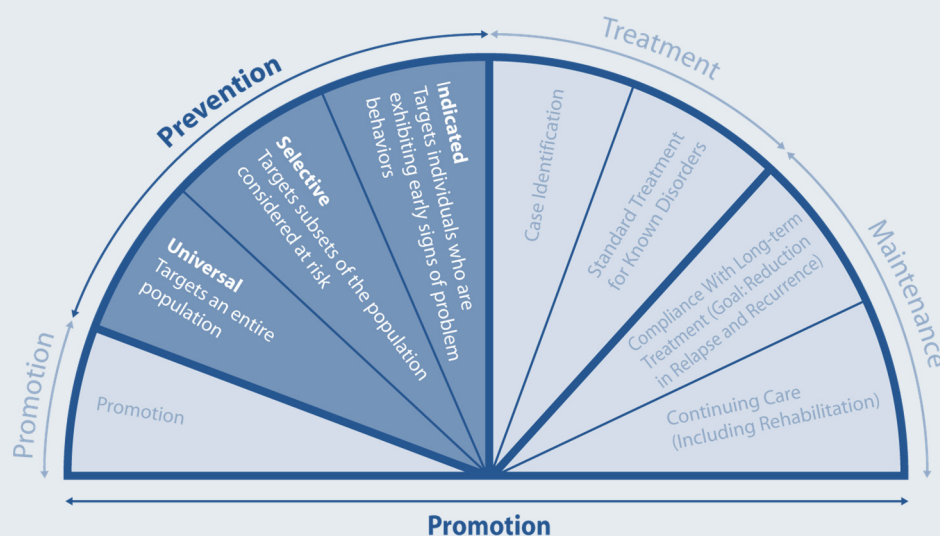
- Online collaborative care/case management models for clinicians, which enable coordination of services among a network of providers and their clients (and sometimes clients' extended networks of family members and/or significant others).
- The ability to reach large populations (especially when delivered in nonspecialty settings, such as universal prevention efforts using online technologies).

Technology can play a role across the spectrum of prevention efforts (Exhibit 1.1-2).

The use of technology also offers individuals the opportunity for personalized recovery monitoring and management, including links to online or mobile recovery support groups (sometimes called virtual support groups). This may allow for new models of care in which individuals can take ownership of monitoring their own care and recovery.

The main costs of technology-based therapeutic tools are associated with completing initial development, keeping up with the latest research, training new staff members, and

Exhibit 1.1-2: Types of Prevention as Described by the Institute of Medicine



Source: Institute of Medicine, 2009. Used with permission.

evaluating effectiveness. Deployment costs are relatively limited and are associated with bandwidth for online access, technical support, licensing of the technology, and ongoing equipment maintenance and support. Thus, technology-based assessment and intervention tools may be cost effective and offer considerable utility for many resource-constrained service settings. Overall, TAC, when appropriately applied, holds great potential to have a significant impact on public health.

An Overview of Behavioral Health Technologies

This section provides an overview of specific technologies and their potential applications in behavioral health. This section is organized by types of technology, including telephone/audio counseling and video/Web conferencing tools; self-directed, Web-based, and desktop computer-based therapeutic tools; Web-based text communication (e.g., email, chat, forums); and mobile technologies. There is considerable overlap across these categories. For example, online counseling can refer broadly to any behavioral health service delivered via the Internet, even though delivery to clients can occur via a wide range of delivery platforms (e.g., computers, mobile devices). Nevertheless, the categories establish conceptual clarity and consistency with the approach taken in the literature by Maheu, Pulier, Wilhelm, McMenamin, and Brown-Connolly (2004).

For each category of technology, you will find a brief description and a review of its applications in assessment, prevention, treatment, and recovery support efforts targeting behavioral health. Several examples of how each type of technology has been applied in behavioral health programs are also provided (see Part 2,

Chapter 2, for more real-world program examples).

Although this overview discusses technology and the many ways in which it can be used in detail, clinicians must be careful not to let the technology itself determine how it is integrated into clinical care. Technologies evolve rapidly, and new technologies are emerging all the time; clinicians should consider how a given tool will enhance clinical services and select only those technologies that are likely to be most beneficial to their clinical work and that they and their clients can use competently. Technologies and information technology tools serve supportive roles that enable clinicians to provide enhanced care under particular circumstances; in no way can they replace traditional methods and service delivery. Clinical need and clinical benefit should drive the use of technology—not the other way around!

Some e-therapeutic tools are more effective than others; among these are tools that integrate evidence-based content and evidence-based approaches for technology-dependent delivery (e.g., tools based on research into the optimal use of educational and informational technologies that allow for interactivity, modularity, and multimedia approaches in promoting behavior change; Aronson, Plass, & Bania, 2012; Bickel, Marsch, Buchhalter, & Badger, 2008; Campbell et al., 2014; Consolvo, Landay, & McDonald, 2009; Danaher, McKay, & Seeley, 2005; Gustafson et al., 2014; Ritterband & Tate, 2009; Webb, Joseph, Yardley, & Michie, 2010). Although TAC can mimic aspects of traditionally delivered, in-person behavioral health services, it differs in a number of ways. For example, self-directed, technology-based interventions, such as online skills training programs, cannot optimally engage clients in role-play; however, they can help ensure that clients are active participants in the learning process and can

document what content clients have or have not mastered in a given program (Marsch et al., 2013). As a result, technology-based approaches to behavioral health assessment and intervention should not be held to the same standards as traditional models of care; rather, consider what technology can do well and what it can do less well when embracing a TAC approach. Technology-based approaches should still be evaluated with the same rigor as traditional approaches and need to show evidence of empirical support before they are used in clinical settings (Kiluk et al., 2011). The use of technology warrants the same types of considerations as traditional care, such as being sure the client is benefiting from its incorporation into treatment, considering how and when to terminate its use in the context of the client's best interests, and monitoring the treatment process to note whether any modifications to the technology will be necessary.

Telephone/Audio Counseling and Video/Web Conferencing Tools

Understanding these technologies

Telephone or audio counseling allows for synchronous communication and delivers behavioral health services to clients via the telephone (the terms “telephone” and “audio” are used interchangeably hereafter). Telephone-based counseling services have existed for decades, so they no longer reflect use of a new technology, but this type of technology-dependent service delivery is still promising. Telephone counseling is distinct from interactive voice response (IVR) and therapeutic interactive voice response (TIVR) technologies, in that telephone counseling typically involves clients' verbal communication with a clinician by phone in real time, whereas IVR and TIVR approaches typically require clients to communicate verbally with a computer database by phone (e.g., interacting vocally with a computerized menu

of options and receiving automated feedback based on their input).

Video or Web conferencing can be conducted in a number of ways, but it typically involves a behavioral health specialist evaluating and providing consultation or counseling to a client via live, two-way, interactive audio/video connection. Synonymous terms include online counseling, Web therapy, distance counseling, telemental health, cybercounseling, and behavioral telehealth. The Health Resources and Services Administration's Web site (<http://www.hrsa.gov/ruralhealth/about/telehealth>) defines telehealth as “the use of electronic information and telecommunications technologies to support long-distance clinical healthcare, patient and professional health-related education, public health and health administration.”

Telephone-based counseling is already a common practice, and video or Web conferencing as well as other types of telehealth approaches are rapidly growing in acceptability. The increasing availability and reduced cost of voice over Internet protocols (VOIPs), broadband connections, and video quality are making telehealth models more accessible to large numbers of individuals. The distinction between these approaches has diminished with the ever-growing availability of mobile phones and tablets, which often include video technology and thus allow for more efficient use of telephone- and video-based therapeutic interventions. Many states have, and some are developing, specific laws, rules, and regulations regarding telehealth interventions.

Applying these technologies to behavioral health

Reviews of the scientific literature on telephone-based counseling have underscored the utility of this approach in a number of areas, such as physical activity and dietary behavior

change (Eakin, Lawler, Vandelanotte, & Owen, 2007), smoking cessation (Meites & Thom, 2007), and improvement of mental status and quality of life (Mohr, Carmody, Erickson, Jin, & Leader, 2011; Piette et al., 2011). This approach also increases follow-up capabilities in healthcare settings (Racine, Alderman, & Avner, 2009) via telephone-based contacts or visits. Additionally, interventions via telephone can be clinically useful tools when addressing the behavioral health needs of clients in primary care settings (Glasgow, Bull, Piette, & Steiner, 2004; Jordan, Ray, Johnson, & Evans, 2011). Several studies have demonstrated the feasibility, acceptability, and efficacy of using the telephone to obtain data regarding their substance use from adolescents receiving treatment for substance use disorders and to provide telephone-based counseling interventions targeting substance use among youths (Burleson & Kaminer, 2007; Kaminer, Burleson, Goldston, & Burke, 2006; Kaminer & Napolitano, 2004). These studies highlight the efficacy of telephone-based interventions and suggest that youths may prefer telephone-based interventions to in-person counseling. Recent review papers also support the use of telephone-delivered

behavioral counseling as a tool for improving health in people with chronic illness (Muller & Yardley, 2011).

Telephone-based IVR interventions have been shown to have considerable clinical utility in areas such as the behavioral management of chronic pain (Naylor, Keefe, Brigidi, Naud, & Helzer, 2008) and as part of posttreatment smoking cessation efforts (Regan, Reyen, Lockhart, Richards, & Rigotti, 2011). As telephones, including mobile phones, have been a routine part of life for so long, research typically shows that both clinicians and clients are comfortable with telephone-based counseling. Indeed, many clients consider telephone counseling a satisfying and helpful process (Reese, Conoley, & Brossart, 2002, 2006).

Video conferencing/telehealth approaches have been increasingly useful to a wide range of clients, including individuals in remote locations (e.g., Alaskan Native villages), the elderly, military personnel, individuals who are hearing impaired, and incarcerated individuals (Simpson & Morrow, 2010), as well as those with serious mental illness (SMI; Sharp, Kobak, & Osman, 2011). Although more research is needed, data to date suggest that

HealthCall and HealthCall-S

The growing use and affordability of smartphones continues to stimulate their use by researchers for gathering data and developing innovations in behavioral health clinical applications with IVR systems. For example, to monitor substance use, Hasin, Aharonovich, and Greenstein (2014) developed HealthCall-S as an adaptation of the HealthCall IVR programs that have been used in research and clinical practice for more than 5 years. HealthCall's self-monitoring component allows users to monitor their drinking by answering questions about their behaviors; they "receive reinforcement for doing so (e.g., 'We're glad you called')" (Hasin et al., 2014, p. 2). Clients also receive personalized feedback through in-person interactions with a staff member, as the contributors to the development of HealthCall found that participants preferred a combination of technology-based and interpersonal support interventions. HealthCall-S was specifically designed to take advantage of smartphone capabilities and to do so with input from clients themselves; a pilot study showed its acceptability by clients and some limited evidence of its possible usefulness in promoting abstinence among individuals with both HIV and alcohol dependence. Another study that highlighted the role of smartphones in managing symptoms of mental illness was a pilot study of a smartphone intervention with clients who had schizophrenia; results showed acceptability and preliminary efficacy for reducing symptoms in clients over the course of the month-long study (Ben-Zeev et al., 2014).

video conference-based interventions produce outcomes comparable to more traditionally delivered in-person counseling and may provide a useful alternative when in-person counseling is not possible (García-Lizana & Muñoz-Mayorga, 2010b; Norman, 2006). Additionally, some evidence suggests that clients may participate in counseling sessions more if they are offered in a distance telehealth environment as an alternative or an adjunct to in-person settings (Day & Schneider, 2002).

Self-Directed, Web-Based, and Computer-Based Therapeutic Tools

Understanding these technologies

Self-directed, technology-based therapeutic tools are typically assessments and interventions provided as stand-alone programs via technology-based platforms. These programs are self-directed in the sense that clients can access and use them with or without assistance from a clinician. Often, these programs enable both clients and providers to access helpful

information. For example, clinicians may receive updates about client activity from the program, and clients may access help in determining how to use and benefit optimally from the program.

These therapeutic tools are accessible online (e.g., interactive, Web-based coping skills training programs; Web-based behavioral management software) or as computer-based programs run from a DVD or a flash drive on a local machine. Computer-based programs that are not Web based may have utility in specific settings where Internet access is limited, such as in criminal justice settings and certain residential treatment programs. However, Web-based, self-directed therapeutic tools offer a number of advantages, including the ability to update centrally and deploy content within a given program as needed (e.g., when new information becomes available that is important for an entire population to receive), the ability to track user activity within a program over time via unique login information, and aggregation of user activity data across client groups (e.g., to allow a provider to review summary information of all of his or her clients). Although the Internet and online assessment and intervention tools are accessible via mobile devices (mobile phones, tablets, and other devices), this section focuses on therapeutic tools accessed primarily via desktop or laptop computers. Therapeutic tools accessible via mobile devices are described later in this chapter.

Telehealth Video Session Produced by the National Frontier and Rural Addiction Technology Transfer Center

The Substance Abuse and Mental Health Services Administration (SAMHSA)-funded Addiction Technology Transfer Center (ATTC) Network has designated its National Frontier and Rural (NFAR) ATTC as the focus area lead for the delivery of addiction-related telehealth services to frontier and rural communities. Telemental health, addiction, and training services were first introduced into frontier and rural areas decades ago (LaMendola, 1997). NFAR provides free resources and ongoing “Telehealth Tuesdays,” including an easily accessible 15-minute counseling session video with a client in continuing care, all of which are available online (<http://www.attcnetwork.org/national-focus-areas/content.aspx?rc-frontierrural&content=STCUSTOM1>).

Applying these technologies to behavioral health

Interventions that incorporate computer-based, self-directed interactive technology have been used to assess behavioral health, to provide services, and to promote health behaviors related to diabetes (Wise, Dowlatsahi, Farrant, Fromson, & Meadows, 1986), eating disorders (Tate, 2011), substance use disorder

prevention (Chiauzzi, Brevard, Thurn, Decembrele, & Lord, 2008; Chiauzzi, Green, Lord, Thum, & Goldstein, 2005; Hester & Delaney, 1997; Marsch, Bickel, & Badger, 2007; Schinke, Schwinn, & Cole, 2006; Schinke, Schwinn, Di Noia, & Cole, 2004; Schinke, Schwinn, & Ozanian, 2005), HIV/AIDS prevention (Marsch & Bickel, 2004; Marsch et al., 2011; Noar, Black, & Pierce, 2009), and methadone maintenance treatment (Marsch et al., 2013). Computerized treatments for mental disorders have been most widely developed and extensively used for anxiety, traumatic stress, and depressive disorders (Barlow, Ellard, Hainsworth, Jones, & Fisher, 2005; Newman, Consoli, & Taylor, 1997; Newman, Kenardy, Herman, & Taylor, 1997; Selmi, Klein, Greist, Sorrell, & Erdman, 1991). Computer-based interventions to treat these disorders may, in part, reflect the manuals developed for cognitive-behavioral treatments of these disorders. Treatments that have been broken down into discrete procedures as part of the production of a treatment manual are easy to adapt for computer-based interventions. For example, computer

programs have successfully implemented such mental health techniques as cognitive restructuring (Selmi, Klein, Greist, Sorrell, & Erdman, 1990), relaxation training (Buglione, DeVito, & Mulloy, 1990), systematic desensitization (Chandler, Burck, Sampson, & Wray, 1988), and self-exposure (Carr, Ghosh, & Marks, 1988). Furthermore, an interactive, Web-based intervention called the Therapeutic Education System (Bickel et al., 2008; Campbell et al., 2014) effectively delivers cognitive-behavioral therapy/community reinforcement approach treatment for individuals with substance use disorders and may be as effective as counseling delivered by highly trained clinicians. A computerized program for substance use disorders that is theoretically grounded in cognitive-behavioral therapy (the CBT4CBT program; Carroll et al., 2008; Carroll et al., 2014) can significantly enhance outcomes when provided as an adjunct to traditional treatment for substance use disorders, and other programs have effectively integrated motivational interviewing approaches (Hester, Squires, & Delaney, 2005; Ondersma, Chase, Svikis, & Schuster, 2005; Ondersma, Svikis, & Schuster, 2007) that target alcohol and other substance use disorders.

An automated, Internet-based contingency management (abstinence reinforcement) intervention called Mōtiv8, which obtains video-based evidence of smoking behavior and reinforces evidence of behavior change (e.g., smoking reduction, abstinence), has produced outcomes that generally meet or exceed the effects produced by nicotine replacement therapies (Dallery & Glenn, 2005; Dallery, Glenn, & Raiff, 2007). An interactive decision support system has shown great promise in helping individuals with SMI initiate smoking cessation treatment (Brunette et al., 2011).

The use of computers may help increase behavioral health counselors' awareness of

Computer-Based Training for Cognitive-Behavioral Therapy

Investigators are conducting a randomized clinical trial (Clinical Trial NCT 01615497) of a Web-based version of a computer-based training for a cognitive-behavioral therapy program called CBT4CBT, which was specifically designed to address alcohol use. Clinical Trial NCT 01615497 is evaluating CBT4CBT's effectiveness relative to standard outpatient counseling in a substance use disorder treatment unit. CBT4CBT teaches basic coping skills, offers video-based examples of effective use of coping skills in various realistic situations, and allows clients in substance use disorder treatment to practice and review new skills.

Source:
<http://www.clinicaltrials.gov/show/nct01615497>

community-based resources for client referrals (Carise, Gurel, McLellan, Dugosh, & Kendig, 2005). Additionally, research evaluating computerized tools for providing screening, brief intervention, and referral to treatment for behavioral health needs has generated promising results to date (Vaca, Winn, Anderson, Kim, & Arcila, 2011; see Part 3 of this TIP, the online literature review, for more information). Interactive computer games targeting various areas of behavioral health have also shown promise (Foley & Maddison, 2010), including games that use virtual coaches (Watson, Bickmore, Cange, Kulshreshtha, & Kvedar, 2012). Overall, literature reviews on the use of computer-generated health behavior interventions underscore the effectiveness of such interventions in producing health behavior change (Moore, Fazzino, Garnet, Cutter, & Barry, 2011; Revere & Dunbar, 2001; Tate & Zabinski, 2004; Taylor & Luce, 2003; Wantland, Portillo, Holzemer, Slaughter, & McGhee, 2004). Comparisons of computer-delivered interventions with person-delivered interventions generally report comparable outcomes (Marsch & Bickel, 2004; Marsch et al., 2007; White et al., 2010).

Web-Based Text Communication: Email, Chat, Forums, Electronic Mailing Lists, and Social Networks

Understanding these technologies

This section focuses on text-based communication that may be useful in the behavioral health arena, with a particular focus on email, chat rooms, electronic mailing lists, and forums. Text-based communication that most frequently occurs via mobile devices (e.g., text messaging) is described later in this chapter.

Chat rooms typically refer to open “rooms” online in which individuals can come and go as they wish and communicate synchronously with any or all participants in the chat room.

Many, but not all, chat rooms that focus on behavioral health are moderated by a clinician who posts comments, guides discussions, and sometimes screens comments written by others before allowing them to post. Whether chat rooms are overseen by clinicians or by peers, they typically include guidelines for participation, with designated moderators who monitor content to ensure that participants remain on topic and are appropriate and respectful. Instant messaging typically refers to a private, real-time communication between two or more people in a secure (not public) chat room. However, privacy issues can become an issue in chat rooms, particularly those that are not monitored.

Online support forums are typically organized in a bulletin board format that allows users to post anonymous, text-based communications. Online support groups typically enable asynchronous communication, as do electronic mailing lists (email lists that do not require logging in to a Web site to view postings). For example, the support forum Patients Like Me (<http://www.patientslikeme.com>) offers Web-based exchanges of information among clients or interested parties related to numerous health conditions and disorders, including types of depression ranging from major depressive disorder to postpartum depression.

Online social networks let members keep in contact with others and/or meet new people. These sites offer a number of elements, including blogs, pictures, chat and private messaging capabilities, and videos. At the time of this writing, Facebook is one of the most popular online social networks. As of March 31, 2015, Facebook reported 1.44 billion monthly users and 936 million daily users worldwide (Facebook, 2015). Facebook has collaborated with several suicide prevention efforts, including those of SAMHSA, to offer unique forms of prevention through social media (for more

information, see <http://blog.samhsa.gov/2011/12/13/facebook-provides-first-of-a-kind-service-to-help-prevent-suicides/>). Although the online social network of the moment may change over time, online social networks will likely persist, offering considerable potential to function as platforms for behavioral health screenings, brief interventions, and referrals to care. Note that it is possible to set up semi-private online social networks (often within larger online social networks) composed of individuals with common interests (e.g., smoking cessation). For more about social networks and introductory information, see “Emerging Technologies and Future Opportunities” later in this chapter and “Internet Security and Privacy Considerations for Clinicians and Clients” in Part 2, Chapter 2.

Applying these technologies to behavioral health

Text-based communication can be used in a number of ways in the behavioral health arena. Email can be used for routine contacts, such as setting appointments, or for therapeutic purposes, such as following up on counseling sessions (e.g., to send motivational messages encouraging clients to engage in specific therapeutic activities between scheduled counseling sessions) or actually conducting some portion of counseling. Emails, encrypted or unencrypted, can be automated (e.g., system-generated prompts to encourage clients to keep daily diaries) or generated by providers. Providers can choose to accept and monitor email responses from clients, allowing for dialog, or they can limit communication to one-sided messages sent from the clinician to the client. Email has utility in addressing issues such as eating disorders, smoking cessation, work stress, and weight-loss counseling (Polosa et al., 2009). As with all forms of electronic communication, compliance with the Health Insurance Portability and Accountability Act

(HIPAA) and other federal and state regulations regarding privileged communication is a primary concern.

Chat counseling in chat rooms or via instant messaging can achieve purposes similar to those of email but typically requires more abbreviated interactions (e.g., abbreviated words, emoticons; Derrig-Palumbo, 2010). Chat counseling can target an array of behavioral health issues, including problematic alcohol use (Blankers, Koeter, & Schippers, 2011), stress management (Hasson, Brown, & Hasson, 2010), and HIV prevention (Rhodes et al., 2010).

Online social networks can be an excellent forum for conducting online surveys and assessments related to behavioral health (Lord, Brevard, & Budman, 2011). Research into optimal uses of online social networks for behavioral health interventions is still in its infancy, but work to date underscores the potential utility of this platform in engaging hard-to-reach populations (Levine et al., 2011) and promoting behavior change (Moreno et al., 2009), particularly when offered in the context of online communities or support groups that target specific behavioral health issues (Griffiths, Calear, & Banfield, 2009; Selby, van Mierlo, Voci, Parent, & Cunningham, 2010). However, online social networks can be problematic due to their general lack of HIPAA compliance and because of the tendency of clients to post private information in public forums. Additionally, providers who use such networks are faced with how to act on their legal and ethical duties in such venues. Many service delivery organizations, state governance groups, and funders use online survey instruments, either within social platforms or as stand-alone tools, to assess targeted population needs for planning activities or to collect satisfaction data.

Mobile or Handheld Technologies

Understanding these technologies

The term “mobile devices” refers to a number of types of handheld and mobile computers, but it most frequently denotes mobile phones and includes both smartphones (handheld computers that can run a complete operating system and thus can function as a platform for app developers) and feature phones (mobile phones that have less computing capacity than smartphones). The popularity of mobile phones has increased dramatically in recent years. Global penetration of mobile cellular subscriptions has reached 87 percent and currently stands at 79 percent in the developing world, with about 6 billion mobile phone subscriptions worldwide; mobile broadband subscriptions have grown 45 percent annually over the past 4 years, and today, there are twice as many mobile broadband as fixed broadband subscriptions (ITU, 2011b). Given the widespread use, ease of use, portability, and high level of computing capacity of even basic feature phones, these technologies offer great potential for affecting public health and healthcare delivery.

Applying these technologies to behavioral health

Mobile devices can be used for a wide variety of therapeutic purposes, including:

- Mobile data collection tools to obtain data about users’ emotional states and behavior in real time (e.g., ecological momentary assessment; Shiffman, 2009).
- Short messaging services (SMS), also known as text messaging or texting, which typically allows a limited amount of data to be transmitted (usually between cell phones). SMS is easy to use and allows for data to be entered into a database and monitored in real time (Lim, Hocking, Hellard, & Aitken, 2008; Merz, 2010),

which in turn facilitates the sending of messages that encourage client/recipient engagement in health promotion and/or treatment-related activities.

- Applications embedded on mobile devices and/or accessed on servers via mobile devices to provide in-the-moment interventions designed to reduce health risk behavior. Although many apps are accessed primarily on mobile phones, these software programs are often accessible on a wide array of hardware, including tablets and other computer platforms.

The use of mobile devices for collecting data in real time has led to enormous advances in understanding the behavior states of individuals. Collection of real-time data via these devices can provide data that are more accurate than data obtained via retrospective recall (Ben-Zeev, McHugo, Xie, Dobbins, & Young, 2012; Shiffman, 2009). Data collection via mobile devices in real time also offers the opportunity to provide in-the-moment interventions in response to participants’ behavior state, addressing their mood, medication regimen compliance status, symptoms, or functioning (Granholm, Ben-Zeev, Link, Bradshaw, & Holden, 2012). Offering evidence-based interventions via mobile devices and apps holds great promise for enabling access to behavioral health services outside of formal treatment settings and when individuals may be most likely to engage in risky behavior. Participation in therapeutic activities in one’s natural environment and outside of formal systems of care may enhance outcomes (Carroll et al., 2008; Carroll, Nich, & Ball, 2005), enabling more generalization of skills as applied in real-world settings.

The scientific literature on mobile phone-based interventions, although limited to date, suggests that they may hold great promise. One-sided text messages, for instance, from

provider to consumer, have shown considerable utility in promoting treatment compliance (e.g., for asthma, diabetes, medication management; Franklin, Waller, Pagliari, & Greene, 2003, 2006; Tasker, Gibson, Franklin, Gregor, & Greene, 2007) and self-monitoring of health behavior, such as healthy eating and exercise. Text message prompts can also significantly improve attendance at medical appointments (Chen, Fang, Chen, & Dai, 2008; Downer, Meara, Da Costa, & Sethuraman, 2006; Leong et al., 2006) and compliance with vaccinations (Villela et al., 2004). Moreover, these prompts show promise in weight loss (Gerber, Stolley, Thompson, Sharp, & Fitzgibbon, 2009; Shapiro et al., 2008) and HIV risk reduction (Juzang, Fortune, Black, Wright, & Bull, 2011).

More recent developments in mobile technology enable the continuous tracking and monitoring of health information as well as interactive programming on mobile phone platforms. Additionally, two-way text messaging may allow clients to input data that lead to in-the-moment interventions delivered in real time, enabling clients to connect with behavioral

health service providers in many different settings. This technology has facilitated the development of more sophisticated mobile interventions to promote behavior change, including weight loss (Joo & Kim, 2007; Patrick et al., 2009) and diabetes management (Cho, Lee, Lim, Kwon, & Yoon, 2009; Kim & Kim, 2008; Quinn et al., 2008). One example of using advances in programming and adaptive algorithms to permit apps to select content based on an individual's characteristics and prior responses is a program that provided text messages and other information to employees with diabetes that enabled each employee to regulate the number of text messages that the employee would receive (Nundy et al., 2014). By being sensitive to how an employee felt about the number of text messages received, the researchers hoped to build engagement with and acceptance of the program and its use. Evidence showed that their client-centered efforts worked; many participants were happy to receive several messages a day, with one employee stating that the messages made him feel that he did not have to handle the complexities of his diabetic condition entirely on his own.

PTSD Coach

PTSD Coach is an app created by the VA's National Center for PTSD and the U.S. Department of Defense's National Center for Telehealth and Technology. This app helps users learn about and manage symptoms that commonly occur after trauma. Features include:

- Reliable information on posttraumatic stress disorder (PTSD) and treatments that work.
- Tools for screening and tracking symptoms.
- Convenient, easy-to-use skills to help clients handle stress symptoms.
- Direct links to support and help.
- Continuous accessibility; the app is available to clients whenever they need it, wherever they are, so long as they have an appropriate, enabled device.

Together with professional treatment, PTSD Coach provides clients who have or may have PTSD with dependable, trustworthy resources. Family and friends can also learn from this app. As of February 2014, PTSD Coach has been downloaded 138,000 times in 84 countries.

Source: <http://www.ptsd.va.gov/public/pages/PTSDCoach.asp>



Mobile phone-based interventions show promise in reducing smoking and alcohol use (Brendryen, Drozd, & Kraft, 2008; Brendryen & Kraft, 2008; Free et al., 2009; Haug et al., 2008; Lazev, Vidrine, Arduino, & Gritz, 2004; Obermayer, Riley, Asif, & Jean-Mary, 2004; Riley, Obermayer, & Jean-Mary, 2008; Rodgers et al., 2005; Weitzel, Bernhardt, Usdan, Mays, & Glanz, 2007; Whittaker et al., 2009). Mobile devices can also function as tools to prevent substance use disorder relapse (McTavish, Chih, Shah, & Gustafson, 2012). Embedding elements of cognitive-behavioral therapy on mobile devices can significantly increase treatment retention and improve abstinence as part of outpatient substance use disorder treatment (Marsch, 2011a).

It is important to understand the empirical support for various mobile interventions before recommending their use in clinical contexts. In addition to reviewing published studies that evaluate various technology-based tools, including studies covered in Part 3 of this TIP (available online), some centralized resources are available to help individuals evaluate the empirical support for many technology-based

behavioral health tools (e.g., <http://www.c4tbh.org/technology-in-action/program-reviews>; Maheu, Pulier, & Roy, 2013; <http://nrepp.samhsa.gov>; <http://www.telementalhealthcomparisons.com>).

Exhibit 1.1-3 provides examples of technology-based therapeutic tools targeting differing areas of behavioral health and using various types of electronic media.

Emerging Technologies and Future Opportunities

Significant developments in technology continue to emerge and offer great promise for integration into behavioral health services. Ubiquitous computing (sometimes called ubicomp or pervasive computing) and ambient intelligence are rapidly evolving fields in which human-computer interactions are embedded into everyday objects and activities. Ubiquitous or pervasive computing typically refers to technologies that “weave themselves into the fabric of everyday life until they are indistinguishable from it” (Weiser, 1991, p. 94). For example, ubiquitous computing technologies may include sensors to assess physiological states. Such sensors are worn by individuals on their bodies or are embedded within mobile devices, allowing the unobtrusive and objective measurement of psychophysiological states, as well as biological and environmental variables, in real time (e.g., via interaction between the sensors and mobile computing devices). One example of this approach is a suite of wearable sensors that collect and process cardiovascular, regulatory, and thermoregulatory measurements to infer stress as individuals move through their daily lives (Ertin et al., 2011). Other sensors infer physical activity, social interactions, and behavioral risk factors by capturing and interpreting a variety of characteristics of speech via smartphone (Choudhury et al., 2008). Barnett, Tidey,

Text-Based Smoking Cessation

Text messaging interventions provided via mobile devices can increase smoking cessation, particularly among higher-income individuals. One such intervention, txt2stop, can more than double biochemically verified smoking cessation (Free et al., 2013). Compared with standard support, the txt2stop intervention, which delivered five text messages per day for the first 5 weeks and allowed users to text the words “crave” or “lapse” to receive an instant message of support when a craving struck, produced 10.7 percent continued abstinence at 6-month follow-up, compared with just 4.9 percent continued abstinence among participants who had received standard smoking cessation services (National Institute for Health Research Clinical Research Network, 2011).

Exhibit 1.1-3: Examples of Technology-Based Therapeutic Tools Across Technological Categories

Telephone/audio conferencing	Telephone Monitoring and Brief Counseling Intervention: 15-minute phone calls weekly between counselor and client; accompanying client workbook targeting substance use (McKay et al., 2004).
Video/Web conferencing	VA National Telehealth Services: Designed for counselors to treat numerous diagnoses in VA clients via multiple treatment modalities in a wide range of settings (http://www.telehealth.va.gov/real-time/index.asp).
Self-directed, web-based tools	Online, Tailored Interventions Targeting Obesity and Eating Disorders: Self-directed, Internet-based behavioral treatment (Tate, 2011).
Email	Email-Based Psychotherapy: Therapeutic intervention targeting depression (Vernmark et al., 2010).
Chat	Internet Chat as Aftercare: An 8- to 10-session online chat-based continuing care intervention to facilitate transfer from inpatient to outpatient psychiatric care (Golkarnay, Bauer, Haug, Wolf, & Kordy, 2007).
Text	txt2stop: Mobile phone text messaging intervention to promote smoking cessation (Free et al., 2011; see the Text-Based Smoking Cessation box in the “Mobile or Handheld Technologies” section of this chapter).
Forums	Schizophrenia Online Access to Resources: Online therapeutic forum for individuals with SMI (and their supporters) that focuses on helping individuals solve problems, achieve personal goals, and meet personal needs (Rotondi et al., 2010).
Tools for mobile/handheld devices	Addiction Comprehensive Health Enhancement Support System: Personalized monitoring/support for individuals in recovery from substance use disorders; global positioning system to detect when users are nearing high-risk environments; personalized stories of recovery experiences; links to support network (Gustafson et al., 2011). PTSD Coach: See the “PTSD Coach” box in the “Mobile or Handheld Technologies” section of this chapter.
Emerging technologies	National Center for Telehealth and Technology (T2): Provides innovative solutions in health technologies for traumatic brain injuries and psychological health through such mobile apps as T2 Mood Tracker and Breathe2Relax, among other efforts (http://t2health.dcoe.mil/apps/t2-mood-tracker). AutoSense: Wearable sensor suite for inferring stress (Ertin et al., 2011).

Murphy, Swift, and Colby (2011) conducted a pilot contingency management study using a transdermal alcohol sensor that measures the

very small amount of ingested alcohol that is excreted through the skin. The Secure Continuous Remote Alcohol Monitoring bracelet

used in this pilot study is being used in veterans' treatment courts, including the Center for Substance Abuse Treatment (CSAT)/Justice for Vets collaborative Mentor Court in Tulsa, OK (<http://www.justiceforvets.org/veteran-mentor-courts>).

Ambient intelligence refers to an intelligent environment or an intelligent service system that can anticipate, adapt to, and meet users' needs. Although these evolving technologies (such as smart homes) have only just started to be applied to behavioral health, they could have a marked impact on the field, incorporating many of the technologies already available and in use. These approaches could allow for real-time, unobtrusive psychophysiological measurement and on-demand, continuous access to tailored support, education, and interventions targeting behavioral health. For example, ubicomp tools can obtain real-time data on physiological and environmental factors that precede and follow risk behavior (or healthy behavior) and can provide in-the-moment interventions that are responsive to these factors. These tools may enable unprecedented levels of tailoring for individuals over time. However, such efforts will, of course, require careful consideration of issues related to disclosure, consent, and privacy.

The term "virtual" often refers to anything that takes place online rather than in the real world, but for the purposes of this TIP, "virtual reality" (VR) refers specifically to technology that reproduces realistic conditions and/or computerizes certain aspects of monitoring and/or data collection. The use of VR in helping veterans with PTSD is just one glimpse of the types of future progress that may be achievable with these new technologies.

VR allows users to visualize, manipulate, and interact with computers and highly complex

data (Aukstakalnis and Blattner, 1992). Extensive and promising work has been conducted for more than 15 years in the use of VR to treat combat-related PTSD. Comparing VR with the use of aircraft simulators to train pilots, Brennan (2013) described VR's ability to create "context-relevant simulated environments where assessments and treatment of cognitive, emotional, and motor processes can take place...extend[ing] the skills of the clinician by allowing the clinician to precisely and systematically deliver complex, dynamic, and ecologically relevant stimulus presentations... within which sophisticated interaction, behavior tracking, performance recording, and physiological monitoring can occur" (pp. 377–378).

In addition to more than 190 clinical trials related to VR and exposure therapy for PTSD and other health-related uses of VR (see the "VR and ClinicalTrials.gov" box on the next page), the Army's immersion VR system has produced advances in measurement capabilities, such as the development of a measure for a stress indicator referred to as allostatic load (AL). Allostasis is how the body tries to maintain stability in the face of acute stress. The Army has used VR to develop a measure of AL based on inflammatory, metabolic, cardiovascular, adrenal, and renal systems of the body. According to Brennan (2013), AL gauges the cumulative negative impact of the stresses of daily life, indicating how a person is influenced by such stress in the long term. The concept of AL has led to research on the differences in how people experience stress and on possible measures of resiliency to stress. Thus, the use of VR for research and treatment may not only expand the range of knowledge and the options for treatment, but also lead to a higher level of understanding and experience than has been possible in the past.

VR and ClinicalTrials.gov

A search for VR in the <http://www.clinicaltrials.gov> search engine in early May 2014 yielded 190 clinical trials with topics such as:

- Exposure therapy for PTSD.
- Rehabilitation after a stroke.
- Balance training exercises in older adults.
- Weight loss through the use of a VR platform, Second Life, compared with face-to-face methods.
- Medical and scientific training and education, such as the effects of marijuana.
- Wearable sensors.
- Other physical conditions (e.g., pain and memory conditions) and behavioral conditions (e.g., anxiety management, social phobia, agoraphobia, panic disorder, autism spectrum disorder, attention deficit hyperactivity disorder, smoking cessation, fear of flying).

Integrating Technology Into Existing Services

The ever-widening range of technology-based therapeutic tools becoming available may seem daunting as you attempt to determine which tools will be the most useful in providing TAC to your clients. This section outlines several issues to consider when integrating electronic technologies into your work. First and foremost, you must maintain awareness of the scope of your professional competence and work within its boundaries even as you explore TAC approaches. It is also important to understand which technology-based therapeutic tools have been shown to be the most effective, as not all such tools have both evidence-based content and evidence-based guidance for use. An ethical behavioral health service provider considers available evidence supporting the incorporation of a given technology-based intervention into clinical practice. Rather than use a technology-based intervention merely because the opportunity exists, review

such interventions to ascertain which have been shown to produce optimal outcomes in contexts similar to those in which you will be working (see Part 3 of this TIP, available online, for many such reviews).

Additionally, the types of technology-based tools that will be most useful depend on the audiences being targeted and the settings in which those tools will be used. For example, self-directed, technology-based interventions and asynchronous forms of technology-based communication may be particularly useful with specific subgroups of clients, such as those with social phobias. The same types of technology-based interventions may elicit more honest communication with clients due to the perceived anonymity or confidentiality they enable; clients may be more comfortable addressing particularly sensitive topics in front of a computer screen or a mobile device than during in-person communication. Asynchronous communication and self-directed, technology-based tools can also be particularly useful to people who don't routinely have access to a private space where they can talk on the phone or through VOIP to a clinician but do have access to a computer or mobile device.

In some cases, however, the use of technology in therapy is contraindicated. For client populations that include individuals who are experiencing significant emotional distress or complex situations (such as domestic violence), counselors must give careful thought to how to use technology appropriately to enhance care. Clients who are actively suicidal, homicidal, or severely emotionally distressed may not be good candidates for online care (CSAT, 2009c; International Society for Mental Health Online—Clinical Study Group, 2010; Stofle, 2001). Keep in mind that self-directed and asynchronous tools cannot convey your clients' nonverbal cues (e.g., intoxication, crying) and may not be ideal for clients

who find typing difficult or frustrating. Clients who are isolated and crave social interaction or feel the need to get out of the house may not be good candidates for technological interventions that decrease in-person contacts.

By contrast, self-directed and asynchronous tools may be particularly appealing to teens and young adults who have grown up on the Internet and spend most of their time interacting with some technology. A Kaiser Family Foundation study (Rideout, Foehr, & Roberts, 2010) found that the exposure to media of children and teenagers 8 to 18 years old increased roughly 20 percent from 2004 to 2009. Estimates of the amount of total recreational use of all devices, per day, every day of the week, reached almost 7.5 hours in 2009.

Several studies underscore the acceptability and appeal to youths of computer-delivered interventions relative to more traditional models of care. For example, among the most significant barriers to adolescents' participation in substance use disorder treatment is dislike for their counselors, discomfort talking about personal problems with another person, and finding counseling unhelpful (Mensing, Diamond, Kaminer, & Wintersteen, 2006). As a result, computer-based counseling may be appealing to youths. Indeed, youths may prefer Internet-delivered substance use disorder interventions over more traditional interventions (Chambers, Connors, & McElhinney, 2005). Many youths report that they find interactive computer learning environments preferable to traditional learning environments, in that computer-based learning allows them to solve problems actively and independently while still receiving individualized feedback (McKinsey and Company & U.S. National Information Infrastructure Advisory Council, 1995; Roker & Coleman, 1997).

Additionally, a growing body of research has highlighted the utility of technology for health promotion among aging populations, including the promotion of health-related knowledge and functional longevity (Tse, Choi, & Leung, 2008). Furthermore, computerized cognitive remediation tools designed to enhance cognitive skills through exercises that target problem solving, attention, memory, and abstract reasoning have been shown to have promise in populations with SMI as well as among individuals with substance use disorders (McGurk, Twamley, Sitzler, McHugo, & Mueser, 2007; Pedrero-Perez, Rojo-Mota, Ruiz-Sanchez de Leon, Llanero-Luque, & Puerta-Garcia, 2011).

A key benefit of telephone-based counseling is the accessibility of phones (including cell phones) to a number of populations. Thus, phone-based counseling has broad appeal and utility. It is, however, important to add that the use of technology for technology's sake does not help the clinician or the client. Any use of technology should engage both the clinician and the client, making the use of time more effective and valuable for both.

Legal and Ethical Issues To Consider

Ethical considerations in TAC are often extensions of (and in many cases, overlap with) ethical considerations in traditionally delivered behavioral health services. However, some unique considerations arise for TAC. As clinical practices differ in various settings, it is not possible to cover every possible ethical and legal consideration relevant to the incorporation of technology into behavioral health services. That said, this section addresses some of the most significant ethical and legal issues to consider when providing TAC.

Confidentiality, Privacy, and Security

The use of technology-based therapeutic tools in behavioral health warrants a number of considerations related to confidentiality, privacy, and security. As in traditional clinical scenarios, ethical principles and procedures related to protecting clients' privileged information (confidentiality), protecting clients' rights to control access to their information (privacy), and protecting client data from being accessed without authorization (security) are of paramount importance. However, some unique considerations arise when collecting data and/or delivering interventions using electronic media.

Text-based communications provide a literal transcript of communication between you and your clients (e.g., email, online moderated chat forums) or among groups of clients (e.g., online support groups), but this mode of communication poses certain risks. For example, if a mobile device is used for communicating with a client via text, depending on the settings and device properties, messages stored on the mobile device as well as those sent from the device are likely unencrypted and vulnerable to security threats. Email messages are also usually unsecured and can be accessed by third parties. Even if emails are deleted by both the sender and recipient, they may be preserved by other third parties, such as Internet service providers (ISPs). As mentioned in Exhibit 1.1-1, managing security and confidentiality in TAC is the responsibility of all parties engaged in their use.

A thorough discussion of the broad set of security issues related to the use of mobile devices in the general healthcare environment is beyond the scope of this TIP. The U.S. Food and Drug Administration (FDA) has been issuing guidance as to which sorts of technologies are considered medical devices and which are considered health or medical apps

that do not require approval from the FDA as medical devices. In general, apps that pose lower risk to the public will not be required to seek review as medical devices. The FDA (2014) has described some of these low-risk devices as apps that:

- Help people maintain coping skills.
- Alert people with asthma of environmental conditions.
- Prompt users to check on possible drug interactions with food, herbs, or other medications.
- Use videos to motivate patients to do their physical therapy at home.
- Provide information or screening, counseling, and preventive recommendations from well-known and established authorities.
- Enable a clinical conversation to be recorded for review after the visit.
- Allow users to track behaviors related to diets, exercise, and sleep.
- Engage in mind-challenging tests or games.

Apps that may constitute a risk to patients or others if the device fails to work properly require approval as medical devices. For example, certain devices relay heart function data to medical services that monitor a patient's heart function; if such a device provided false information or failed to operate, it could endanger the patient (FDA, Center for Devices and Radiological Health & Center for Biologics Evaluation and Research, 2013).

The HealthIT.gov Web site (<http://www.healthit.gov/providers-professionals/your-mobile-device-and-health-information-privacy-and-security>), operated by the Office of the National Coordinator (ONC) for Health Information Technology, offers a number of resources for healthcare providers related to using mobile devices in a way that helps protect and secure client health information. Exhibit 1.1-4, adapted

Exhibit 1.1-4: Areas of Concern for Mobile Computing Devices

Area of Concern	Considerations	Threat Level	Threat Type: Privacy (P)/ Security (S)
DEVICE			
Access control	Control over the user authorization process required to access the device	High	P S
Encryption	Technology in place to protect data at rest	High	P S
Updates	How and when the device is updated	Moderate	S
Software vulnerabilities	Weaknesses in the platform and operating system that may allow unauthorized access to the device	Moderate	S
Backups	How, when, and where backups are handled	High	P S
Mobile malware	Viruses and other malicious software that can steal data, capture keystrokes, or perform other compromising actions	Moderate	P S
Remote management	How the device is managed remotely, if at all, including ability to restrict application access or Web access, encrypt data, remotely wipe data, and so on	High	P S
Device-specific issues	Issues specific to mobile computing devices but not other computing platforms, such as inability to truly erase mobile device storage	High	P S
Platform-specific issues	Issues specific to each mobile computing device platform, such as password storage, application backgrounding or suspending, and so forth	Moderate	P S
APPLICATION			
Access control	Control over the user authorization process required to access the application, including session initiation and management and least-privilege access	High	P S
Inappropriate storage	What information the application stores and whether the level and sensitivity of information support local storage	High	P S
Insecure storage	Ensuring that data are stored in an adequately encrypted fashion.	High	P S
Insecure transport	Ensuring that sensitive data transported over the network are encrypted, including usernames and password, management information, and other data; does the application force the use of encrypted technologies?	High	P S
Updates	How and when the application is updated	Moderate	S
Software vulnerabilities	Weaknesses that may allow unauthorized access to the application	Moderate	P S
Backups	How and where backups are handled	High	P S

(Continued on the next page.)

Exhibit 1.1-4: Areas of Concern for Mobile Computing Devices (continued)

Area of Concern	Considerations	Threat Level	Threat Type: Privacy (P)/ Security (S)
Data leakage	Potential for leaking sensitive information, such as user name, device ID, location, and so forth	Low	P
Platform-specific issues	Ways in which the application uses, disables, or works around platform-specific security issues	Moderate	P S
Back-end server	Server security, presence of a firewall, and protection against normal application security flaws like structured query language injection, misconfigurations, and so forth	High	P S

Source: Healthcare Information and Management Systems Society (HIMSS), 2011. Adapted with permission.

from HIMSS (2011), describes considerations to address in the particular uses of an app. For current information on app security issues, refer to the HIMSS Web site (<http://www.himss.org>).

New information about the regulation of mobile medical apps is rapidly developing. The FDA Web site lists examples of mobile medical apps that it will (<http://www.fda.gov/MedicalDevices/DigitalHealth/MobileMedicalApplications/ucm368743.htm>) and will not (<http://www.fda.gov/MedicalDevices/DigitalHealth/MobileMedicalApplications/ucm388746.htm>) seek to regulate. For a detailed overview of the issues related to the regulatory framework emerging for digital medicine, including developments outside of the United States, Elenko, Speier, and Zohar (2015) provide a cogent review and analysis.

In the United States, text-based communications between providers and clients are protected under HIPAA and some state laws that cover protected health information (PHI), but they can be subpoenaed from providers or ISPs. Text-based communications between a counselor and a child or adolescent pose unique risks, as parents typically have a legal right to view their children's medical records—which

may include some types of communication (Recupero, 2008). HIPAA does not explicitly address the use of some technologies, such as SMS and cell phones. However, several guidelines regarding clinical use of such technologies are available, including the National Institute on Standards and Technology's guidelines for mobile device security, which address potential security issues that must be managed when using such devices for therapeutic purposes (Jansen & Scarfone, 2008), and the ONC Web site on privacy and security for providers and professionals. For example, the subscriber identity module card on a mobile device stores text messages and identifies users of cell phones to the cell phone network. This raises important questions regarding the physical security of the mobile device, along with the importance of encrypting text messages. Encryption is available for telephone communication as well, although it can be cost prohibitive. VOIPs, which enable phone communication over the Internet, typically allow for more accessible encryption technology.

An option with increased security is the use of secure, Web-based messaging systems that allow providers to email clients with a prompt

to log in to a password-protected Web site to retrieve a message (rather than sending the message through multiple servers, as with normal email). You may wish to set up password protection, automatic logouts, firewalls, audit trails, encryption, and authentication for any programs that you use. Also consider whether to include transcripts of electronic communication with clients in client records.

Online counseling services allow for tracking of clients' Internet protocol addresses. This information does not automatically reveal the exact geographic location of a client, but an ISP may be able to provide such information in an emergency. Large online counseling service providers often use proprietary systems for communicating with clients. These systems may include encrypted chat stream identifiers, storage of text communication with clients, and emergency procedures for locating a client's local hospital or police station (Derrig-Palumbo, 2010), which may help effectively manage several of the confidentiality issues reviewed thus far. Ascertaining the security of technology-based communications between providers and clients is important, given that third parties can potentially access such communication. That said, the largest risks are typically low tech and include sending an email to the wrong address, posting one's password in a place visible to others, forgetting to log off, or using an employer-hosted email server (Sands, 2004).

There are a number of legal considerations related to online counseling models. Inter-jurisdictional issues (licensure laws and regulations) that apply when practicing across state lines, for example, must be understood. State licensing boards typically require that a practitioner providing services in a different state also has a license to practice in that state. States also vary in their mandatory reporting laws, such as those related to concerns about

The Distance Certified Counselor

The Center for Credentialing and Education, a subsidiary of the National Board for Certified Counselors, offers a certification called the Distance Certified Counselor, which identifies providers who have met established standards in distance counseling. It is a critical responsibility of clinicians to stay abreast of the evolution of legal issues and best practice guidelines and to implement these in their own work (Maheu, McMenamin, & Pulier, 2013).

abuse of and/or harm to self or others. Additionally, you should be aware of ethical standards and guidelines regarding online counseling models provided by professional organizations. You should further be aware that online counseling best practice guidelines may vary with the specific system and tools you use to deliver TAC. As technology and ethical issues continue to evolve, it is important to obtain professional training and certification.

Clear policies should dictate the use of various technologies to communicate with clients. Establish your own policies (in compliance with your organization's overarching policies) based on your understanding of the risks and benefits of various approaches and clearly communicate this policy to all clients. Ideally, these policies would differentiate between what constitutes PHI and what does not. Many professional organizations offer standards and guidelines in this arena and may be able to help you formulate your own policies as well.

Policies on the use of communication technologies should address issues such as which technologies providers are willing to use in communicating with their clients, when each technology is and is not appropriate for use, and what the potential risks and benefits of using each technology may be. These policies should also cover the extent to which other

Essential Elements of Informed Consent To Participate in TAC

Services process and alternatives:

- Whether communication will be synchronous or asynchronous
- Response standards and scheduling
- Frequency of interactions
- Misunderstandings (text-based and video-based risks)
- Alternative treatments or delivery approaches

Individuals who may have access to clinical information:

- Other providers on both ends of a Web conferencing exchange
- Technical staff members required to operate or maintain the technology
- Other participants in groups or chats
- Supervisors
- Program evaluators or quality assurance monitors

Potential benefits of the service:

- Access to services
- Privacy
- Reflection time
- Access to specialists and supervisors

Confidentiality of communications and records:

- Confidentiality laws that apply to clinical exchanges using technology
- Legal exceptions that apply to telemental healthcare or telemedicine just as they do to in-person clinical work, including child abuse, elder abuse, medical emergencies, threats of violence, or danger to self, as dictated by state and federal laws

Privacy and privacy risks:

- What is being transmitted, including identifiable images, clinical information, appointment reminders, and billing information
- Form of transmission, including attempts to protect privacy using encryption
- Privacy risks inherent in transmission, such as failures of technology, and unauthorized access to electronic information
- Storage/destruction policies for electronic communications (e.g., text messages, emails)

Roles and credentials of all individuals involved in service delivery:

- Names, roles, and credentials of all providers who participate in clinical care and how the client can confirm credentials (includes providers on both ends of a telemedicine exchange)
- Billing or administrative staff members who may contact clients about administrative issues

Emergency procedures:

- Expectations for response to postings, emails, telephone calls, or text messages
- Contact information and procedures if immediate follow-up is needed
- Emergency/crisis services contact information
- Steps providers may take if concerned about safety of a client

Ways for clients to protect their privacy:

- Controlling access to communications through establishing passwords, deleting cookies, and controlling computer access
- Understanding the risks of sharing email accounts
- Limiting or preventing the provision of identifying information on social media
- Identifying Internet security risks
- Installing virus, spyware, and malware detection software

(Continued on the next page.)

Essential Elements of Informed Consent To Participate in TAC (continued)

Charges and payment:

- What the charges for services are, including email exchanges, telephone calls, and text messages
- How charges will be billed
- What the charges will be for no-shows

Service disruptions:

- Ways to handle service disruptions
- Potential impact of service disruptions on privacy or confidentiality
- Alternative ways to contact the provider

Regulatory agencies and grievances:

- Who regulates the service provided
- What are the internal and external channels and contact information for filing a grievance

staff members in a clinical practice may access technology-based communications with clients. These policies should additionally ensure that clients do not assume that there will be real-time communication with clinicians (e.g., a policy to inform clients that they should not use a technology-based intervention to contact their clinician when in crisis, such as when experiencing suicidal or homicidal ideation, making plans, and/or exhibiting intent). All providers should put their TAC policies in writing and clearly communicate them to clients at the start of the therapeutic relationship using an informed consent agreement. It is also helpful to have clients sign off on these policies to acknowledge that they have reviewed them and agree to comply.

SAMHSA offers confidentiality and health privacy resources (CSAT, 2004c; <http://www.samhsa.gov/healthprivacy>). For information on providing TAC to veterans, see the planned TIP, *Reintegration-Related Behavioral Health Issues in Veterans and Military Families* [SAMHSA, planned e]).

Informed Consent

Providers of technology-assisted services are bound by the same legal and ethical requirements and standards of practice that apply to in-person service delivery; however, technology

introduces some additional risks and benefits that should be covered with participants in technology-assisted services. The risks and considerations vary by type of technology used, as well as the type of service delivered. The box beginning on the previous page outlines some of the more common considerations related to technology-facilitated care.

The Digital Divide and Healthcare Disparities

Although Internet and mobile phone access is rapidly increasing all over the world, some populations may have greater access to these technologies than others. Variables that influence access include rural versus urban locations; socioeconomic status; and various demographic characteristics, such as age. Even with access, some people may not be able to engage in TAC readily due to challenges with technological literacy, health literacy, or reading literacy. Additionally, some technology-based tools and interventions may not be accessible to or perceived as useful by various groups if they don't address individuals' needs in a culturally responsive manner. Clients will benefit from tools that are in the language with which they have the greatest facility.

TAC offers great potential to lessen the digital divide and address healthcare disparities

that exist in many traditional models of care. For example, although White Americans (80 percent) are more likely to use the Internet than African (72 percent) or Hispanic (61 percent) Americans, African Americans are the most active users of the Internet via mobile devices. The rate of increase in the use of mobile devices to access the Internet among minority groups has, since 2007, remained at roughly twice the national average—for example, 141 percent increased use for African Americans versus the 73 percent national average (Horrigan, 2009). By offering interventions on a wide variety of platforms to capitalize on the technology most frequently used by various target populations (e.g., developing interventions for mobile devices for specific minority groups), TAC may offer a new service delivery model that could substantially reduce the healthcare disparities present in many traditional care models (Gibbons, 2007). For examples of the use of TAC with Native American populations, see the planned TIP, *Behavioral Health Services for American Indians and Alaska Natives* (SAMHSA, planned b).

Technology-based therapeutic tools not only offer clinical information and support to diverse audiences, but also provide social and supportive functions that may be absent or inaccessible to certain populations via traditional healthcare systems. Because TAC can provide information tailored and responsive to each individual's level of understanding and needs, this approach can accommodate diverse users with differing cultural needs and varying levels of health, technological, and reading literacies (Gibbons et al., 2011).

Legislation and policy changes may soon promote broadband access and digital competence, reducing the digital divide. On May 28, 2015, the Federal Communications Commission (FCC) received proposed changes to the Lifeline Program, which has existed since the mid-1980s and was originally designed to help

people with low incomes pay for phone services; proposed changes would allow the program to support broadband access for low-income individuals (FCC, 2015). Today, households with incomes of \$150,000 or above have easy access to broadband services, whereas slightly less than half of households with incomes below \$25,000 can access such services; moreover, almost half of low-income families have had to cancel or suspend smartphone services due to costs (FCC, 2015). As of June 2015, drafts of proposed legislation had been introduced to the United States Senate: The Broadband Adoption Act (Senate Bill 1472, 2015) and the Digital Learning Equity Act (Senate Bill 1606, 2015). Passage of such types of legislation and related policy changes may help narrow the digital divide.

Electronic Health Records

Another important consideration in using technology-based therapeutic tools in the behavioral health arena is electronic health records (EHRs), which are also called electronic medical records (EMRs). The terms are often used interchangeably, but an EMR typically refers to an individual's patient record created in a single healthcare setting, whereas an EHR typically collects data cumulatively across healthcare settings. EHRs are part of a larger effort to promote meaningful use of health information technology that improves healthcare and enhances information exchange among healthcare professionals. The Health Information Technology for Economic and Clinical Health Act of 2009 and the Patient Protection and Affordable Care Act of 2010 emphasize the widespread and meaningful use of EHRs, which are intended to improve recordkeeping, outcomes reporting, patient transitions across providers (along with their medical records), and quality of patient care (by increasing communication across providers and reducing medical errors). The three main

components of meaningful use are the use of a certified EHR in a meaningful manner, the electronic exchange of health information to improve quality of healthcare, and the use of certified EHR technology to submit clinical quality measures and other measures.

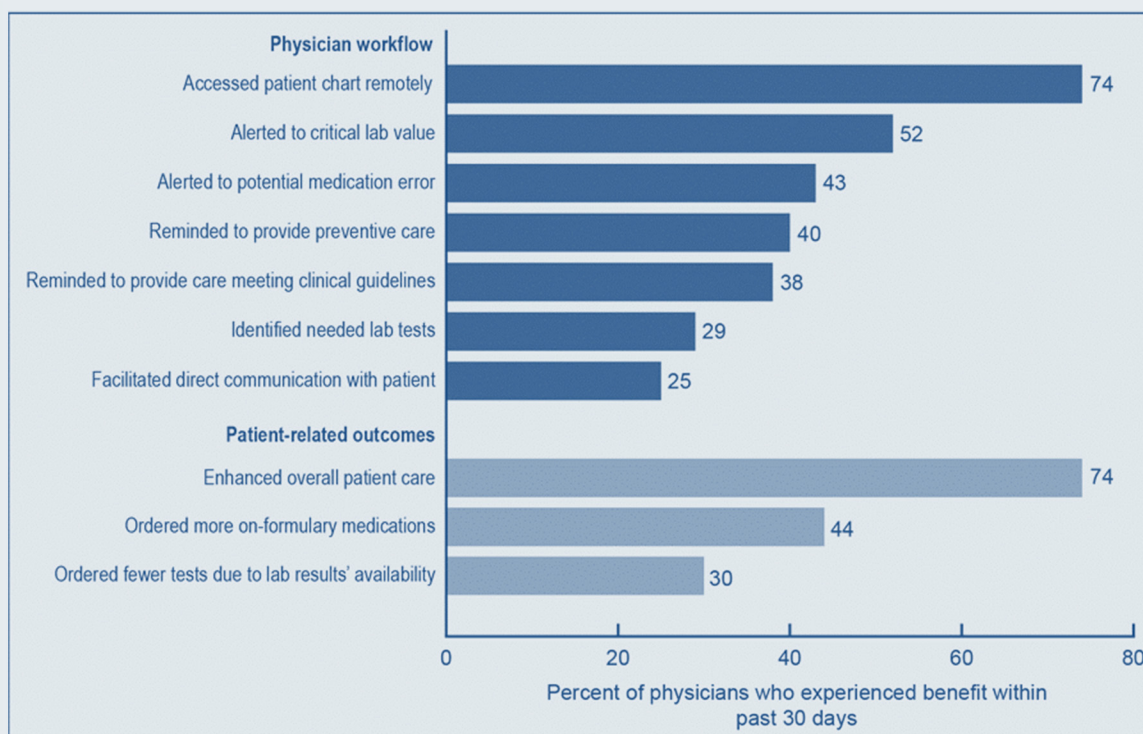
Research and development efforts with EHRs are rapidly expanding in the United States and elsewhere. A complete review of EHRs is beyond the scope of this TIP, but the evolution of EHRs and their application in healthcare settings are well characterized in a number of existing resources. The Agency for Healthcare Research and Quality and the ONC for Health Information Technology provide details on EHRs online (<http://www.ahrq.gov>; <http://www.healthit.gov>).

EHRs offer considerable promise for collecting data on clients' behavioral health along with other medical issues, which may enhance client-centered care and public health. Limited work to date has focused on the inte-

gration of EHRs that include behavioral health data with other technology-based therapeutic tools targeting behavioral health; combining them may markedly influence behavioral health services. For example, Web-based or mobile interventions that collect data as part of screening or assessment activities could code those data in a format that is compatible with EHRs and then interface with EHRs to update relevant information. Such data would provide a richer, more comprehensive picture of clients' behavioral health. Information collected on a client's behavioral health in real time via a mobile application may allow for a better characterization of the client than information collected only during in-person appointments with behavioral health service providers. Such information may enable providers to manage clients' behavioral health more effectively (Exhibit 1.1-5).

At this time, there are no national standards for the collection of data on clients' behavioral

Exhibit 1.1-5: The Benefits of Using an EHR System



Source: Jamoom et al., 2012. Reproduced from material in the public domain.

health, and incompatibility among different types of EHRs impedes the efficient sharing of data. Little research to date has focused on effective strategies for integrating data from technology-based therapeutic tools into EHRs. However, SAMHSA; the National Quality Forum; Health Language, Inc.; and several other groups are working to fill these gaps. For example, several institutes at the National Institutes of Health, in collaboration with the Society of Behavioral Medicine, have launched an initiative to identify common data elements for client-reported measures of behavioral health, which can be used in EHRs (http://www.sbm.org/UserFiles/file/EHR_Meeting_May_2-3-2011--_Executive_Summary.pdf). These common data elements, such as measures of quality of life, eating patterns, substance use, anxiety and depression, and stress, could be used in primary care and public health settings to screen clients for behavioral health risk factors. Doing so could lead to a number of possible benefits, including improved clinical decision making (with greater involvement of clients in shared decisions) and delivery of tailored, brief interventions in these settings.

Emerging research and development efforts will be especially important as behavioral healthcare is increasingly integrated into other healthcare settings and, as a result, is less confined to specialty treatment programs. For example, the 2010 National Drug Control Strategy from the White House Office of National Drug Control Policy (ONDCP) set several goals to integrate treatment for substance use disorders into an array of healthcare settings and not confine such treatment to specialty addiction treatment programs (ONDCP, 2010), and these goals as well as additional goals to increase integration have continued to be part of ONDCP's strategies (ONDCP, 2013). A key strategic action to meet this goal involves expanding addiction treatment into

community health centers (CHCs) and other settings that service low-income populations most often in need of treatment for substance use disorders and mental illness. A critical issue will be maintaining the specifications of Title 42, Part 2, of the Code of Federal Regulations, the confidentiality regulations that govern privacy and confidentiality of records related to substance use disorder treatment. Technology-based approaches to assessing clients' behavioral health and evidence-based interventions that are responsive to clients' behavioral health risk factors may enable clinicians to conduct these activities with excellent fidelity and at low cost for broad client bases. The flexibility and ease of use of technology-delivered approaches can promote access to behavioral health services for hard-to-reach populations who use CHCs and other nonspecialty healthcare settings for other medical services. A technological infrastructure allows collection and storage of select client data; this improves coordination of and continuity of care and activity reporting that facilitates service reimbursement.

Technology-based tools are also growing in use in terms of self-help techniques entirely outside of any formal healthcare-related activities. Many health-promoting apps suggest, but do not require, coordination with healthcare professionals. It is too early to tell which technology-based tools may be helpful as stand-alone, wholly self-directed interventions and which may facilitate coordination and cooperation. Whatever the future holds, TAC is especially likely to enhance the capacity of primary care organizations to attend to the behavioral health needs of their clientele.

Concluding Comments

TAC is widely applicable in targeting behavioral health and may be clinically useful across a spectrum of behavioral health and physical health services, including screening,

assessment, prevention, treatment, recovery management, and continuing care. Various electronic media are of use in behavioral health services and enable entirely new models of behavioral health service delivery. This is an exciting time for harnessing technology

to increase the quality and reach of effective behavioral health services, but a carefully planned approach for embracing TAC is essential to grant behavioral health service providers and program administrators—as well as their clients—the greatest benefit.

