



**Vibrant Emotional Health
The Center for Policy, Advocacy, and Education**

**Advancing Technologies in Behavioral Health Care:
A Policy Briefing and Advocacy Agenda**

Introduction

Behavioral health disorders are a major source of disability and distress. An estimated 26 percent of Americans ages 18 and older ---- about one in four adults ---- suffer from a diagnosable disorder in any given year, and 46 percent will have a mental disorder over the course of their lifetime.¹ Many individuals experiencing mental health and/or substance use disorders often experience comorbid behavioral and physical illnesses, disability, reduced life expectancy, and premature mortality.

Despite the high prevalence of behavioral health disorders, growing acknowledgement of the pain and human suffering they cause, and increasing evidence of the economic burden worldwide, the majority of adults and children with behavioral health needs who could benefit from care go without it. Systemic as well as attitudinal barriers to seeking and receiving behavioral health care have been well-documented in the literature, including: cost, convenience, confidentiality concerns, lack of availability, and fear of stigmatization and discrimination.² Help for these individuals has also been limited by the need for more effective evidence-based treatments, the shortage of behavioral health professionals trained in evidence-based therapies, and the lagging adoption of technology-based solutions to deliver new treatments, enhance access to care and improve behavioral health outcomes.

Technology-based interventions have the potential to significantly improve the efficient assessment and treatment of behavioral health disorders. They offer an unprecedented opportunity to address the human tragedy and public health crises resulting from under-recognized and under-treated substance use and mental health disorders. To date, however, the pathways to wide-spread adoption of these technologies have been filled with numerous barriers and challenges. In response, **Vibrant Emotional Health's Policy Briefing and Advocacy Agenda to Advance Behavioral Health Technology** will highlight technology-based tools and the ways they can improve behavioral health interventions and outcomes in order to:

- **Improve access to mental health and substance use disorder care** for people who would otherwise not see a behavioral health clinician.
- **Mitigate health care and disability costs** for behavioral health conditions.
- **Promote early-identification, assessment, and less-costly treatments** of mental and substance use problems.
- **Empower individuals in self-management** of overall physical and emotional wellness, disease prevention, and disease management.
- **Improve behavioral health outcomes and quality of care** for all individuals in need
- **Reduce morbidity and mortality** of people with co-occurring disorders.

- **Increase general physical and emotional wellbeing** and promote healthy life-styles.
- **Connect people to behavioral health care** where, when, and in the manner in which they wish to receive it.

This policy brief: 1) **provides highlights of technology-based tools** that can improve the care of people with mental health and substance use conditions; 2) **identifies current barriers, concerns, and ethical considerations** that must be addressed in order to advance the use of these tools; and 3) **concludes with recommendations** to support the safe and responsible dissemination of evidence-based technology innovations in behavioral health care. Technology-enabled tools, applications, and new treatment approaches are grouped within each of the following areas:

- **Mobile mental health and wireless technologies** that offer new ways to assess, monitor, and treat behavioral health conditions anywhere, any time.
- **Tele-mental health technologies** that provide behavioral health consultation, assessment, treatment, and support using real-time electronic and information technologies from a distance.
- **Artificial Intelligence and machine learning technologies** that offer new capabilities and perform intelligent functions that can transform behavioral care in the years ahead.
- **Infrastructure technologies** that can collect, manage, and share health care information at multiple points in the health care process, streamline care coordination functions, and facilitate consumer-provider connectivity.

The Technology

While still evolving, advances in technology offer the potential for greater access to behavioral health care at lower cost with better outcomes.² For many people who would never see a clinician because it is too expensive, not convenient, or is just not available, technology has the power to help supply them information on the warning signs of behavioral health conditions and offer immediate self-assessment and self-treatment options. Technologies also offer the ability to use large shared datasets to predict individuals or population cohorts who are likely to experience a behavioral health problem. Such predictive modeling and data analytics can play a significant role in shedding light on the causes of mental health and substance use disorders and the effects of treatments tailored to an individual's characteristics.³

Mobile Technologies in Clinical Practice

The combination of smartphones and tablets, wearable sensor devices, and mobile health (mHealth) offer new ways to monitor and promote mental and physical wellbeing. (Note: the World Health Organization (WHO) broadly defines mHealth as “the use of mobile and wireless technologies to support the achievement of health objectives”).⁴ The availability of mobile devices and health care apps continue to grow rapidly, largely fueled by recognition of the

importance of patients taking an active and informed role in their own healthcare. It is estimated that the number of mHealth apps on the market exceed 165,000, with the largest category concentrated in the areas of physical and emotional wellness, diet, and exercise; however, mHealth apps are also available for the assessment and management of behavioral health conditions; including addictions, depression, anxiety disorders, eating disorders, and other behavioral health diagnoses.⁵

➤ *Passive and Active Assessment Tools*

While historically, clinicians have directly performed assessments of people for the purposes of diagnosis, monitoring the progression of an illness, or evaluating responses to treatment, a growing number of mHealth devices and mobile apps actively engage and empower the user in self-assessment. Apps and other mobile devices have been designed to assess and monitor symptoms on a variety of health measures, such as diet, exercise, sleep, exercise, smoking cessation, relaxation, medication adherence, and more.⁶ Many of the apps developed have the capability to connect to a device or sensor, which greatly improves the accuracy and convenience of data collection for mHealth apps; however, connectivity and communication of consumer mHealth apps with provider healthcare systems continues to be limited,⁷ presenting a barrier to greater adoption.

In addition to providing assessment information *actively* obtained by care-seekers to help identify, diagnose, and track outcome measures related to their physical and emotional well-being, such as levels of anxiety, depression, mania, or suicidal risk, smartphone and other mobile devices can be used to *passively* collect, record and analyze data without a user's direct interaction.⁸ For example, a person's mental state can be evaluated by examining movement patterns, mood states, social interactions (e.g., number of texts and phone calls made, content of interactions), behaviors or activities at different times of day, vocal tone, speed, word choices, facial expressions, biometric and health measures.

While assessing an individual's symptomatology, large quantities of behavioral data can provide vital information for researchers to increase their understanding of mental illnesses and mental wellbeing, help them develop better interventions and better population health outcomes, and potentially predict who may be at risk of developing behavioral health problems before they even experience them.⁹ However, passive monitoring or devices in "smart homes" that capture individuals' data without their knowing can raise personal privacy concerns and raises important policy considerations.¹⁰

➤ *Mobile Health Treatment Interventions*

mHealth devices and digital programs provide near real-time information about a person's

mental and physical health for the purposes of assessment or detection of a problem. They can also provide evidence-based interventions for mental health conditions either as stand-alone programs or as a conjunctive treatment modality. For example, clinical practice guidelines recommend cognitive behavioral therapy (CBT) as a first-line treatment option used for moderate depression and anxiety. The delivery of web-based cognitive behavioral therapy is also well suited to addressing barriers to seeking and receiving behavioral health care. Not only does internet based CBT (iCBT) lower the cost of care by 50% - 75%, it makes treatment for disorders such as depression anxiety, addictions, insomnia, and others available 24 hours a day, 7 days a week, anywhere that there is access to the web, without await list. At the same time, iCBT fulfills the desire for self-sufficiency. For those with concerns about stigma, privacy and confidentiality, the option of being able to access care outside of an office setting, in the privacy of one's own home or location of choice, is particularly appealing. Linking iCBT with limited wrap-around support is a promising practice that is reported to enhance program completion and effectiveness without minimizing the self-directed nature of care.¹¹ In addition, mobile apps can help people log their feelings over the course of a day or record physiological activity (e.g. electrodermal activity, heart rate variability) as they go about everyday routines, thus providing feedback that can be used in the CBT treatment process.

Many smartphones have the capability to connect to external hardware devices, such as biofeedback sensors, to provide information about heart rate, skin temperature, cardiac activity and other physiological functions that can also be useful in the treatment of anxiety, attention deficit hyperactivity disorder, autism, depression, insomnia, post-traumatic stress disorder, substance use disorders, traumatic brain injury, and numerous somatic illnesses. Apps providing mobile physiological monitoring offer increased portability and functionality over home or office based monitors 24/7 from any location, and can be used for purposes of self-guided assessment and treatment or conjointly with clinician-directed interventions. Reported advantages of mHealth treatments include enhanced flexibility and convenience, real-time symptom monitoring and tracking of treatment progress, while offering personalized feedback and motivational support to improve behavioral outcomes.¹²

➤ *Intelligent Wearables*

The development and deployment of intelligent wearables are also on the rise. Popular consumer wearables include accelerometers, GPS technology, heart rate and other sensors that measure an array of physiological functions and make it possible to collect individual health, behavioral, and contextual data. The rapid adoption of remote monitoring is pushing the development of a broad spectrum of wearable tools capable of measuring vital signs inexpensively and non-invasively.

Wearables can be used for accessing information, diagnosing, and delivering interactive treatments in large numbers of medical and behavioral applications, while eliminating the need for more time-consuming and costly office visits. They offer the potential to identify potential

health issues at earlier stages, or respond to adverse occurrences or mental health crises more expediently. It is estimated that by 2021 about two-thirds of mHealth users and nearly 25% of Americans will own a wearable device that involves remote monitoring and remote transmission to health care providers for diagnosing and for disease management.¹³

Examples of bio-monitoring devices now being built into wearables include electrocardiograms (ECGs), electroencephalograms (EEGs), blood pressure and glucose readers, and electrodermal activity devices (EDAs). These devices can help make use of contextual, physiological and other data about users and their environment and have practical uses in behavioral health care and research. For example, EEG is used in home sleep monitoring and biofeedback. ECGs are used to measure heart rate variability, which can have practical application for behavioral health research and in treatments. EDAs have been used in clinical applications to assess a range of emotional states, sleep, epilepsy, and stress. Most of these measurement devices can be used as part of biofeedback interventions that collect data in real-time by multiple sensors for self-monitoring, self-improvements, measuring treatment outcomes, identifying trends in behavior, modifying behavior, and for better managing one's own health status. Data can also be sent via wireless connection to another mobile device, stationary desktop computer or to data systems at a health provider site. Moreover, data from wearables can be quantified to produce population-level metrics.¹⁴

➤ *Social Support and Peer Services*

Social support via the Internet is an often studied area in behavioral health that is increasingly recognized for its potential to provide new opportunities for social engagement and connection. Several empirical studies have demonstrated the benefits of social networking sites for mental health and emotional wellbeing.¹⁵ The proliferation of smartphones has exponentially increased opportunities for social networking by making social media sites even more accessible. Some of the most popular social networking websites (e.g., Facebook, Twitter) have developed apps for users to easily connect with others from their smartphone, thus increasing the potential to give and receive social support regardless of time, day, or location. Several websites have recently turned their attention to health and wellness and are providing resources with one click of a finger-tip, including information on behavioral health issues developed by clinical experts.

Other innovative partnerships between behavioral health organizations and social media companies are using smart technologies to deliver crisis support to people who may be suicidal, as well as provide resources for concerned friends and loved ones. An example is a recent tool unveiled by Facebook in which users who mention something with suicidal, homicidal, or self-harm content in a post are connected to chat with a trained counselor from one of several support organizations.

Peer support is the deployment of persons with lived experience in the service delivery continuum. Using peers is a growing practice that embraces the unique capacity of individuals to

help each other based on a shared affiliation or a deep understanding of the same or similar experience. With technologies changing the ways consumers think about getting services and putting more tools into the hands of individuals, peer specialists are a growing sector of the health and human service sector workforce. The use of smartphones and web-based tools by peers to connect with other peers through online support networks is a promising best-practice for improving behavioral health outcomes and is under increasingly more frequent study. While research to substantiate the effectiveness of peer-to-peer support and dialogue via web and mobile technologies is still in a nascent state, recent studies are beginning to produce empirical data that can speak to the emotional benefits of peer support and the use of on-line tools.¹⁶

Telehealth for Behavioral Health

The use of telehealth and telemedicine in delivering behavioral services has been acknowledged across the field as an important key to addressing one of the biggest challenges: the shortage of behavioral health professionals and its impact on consumer access to care. Yet, while the use of the technology is pervasive in medical settings, telehealth in mental health (also referred to as “tele-behavioral” health or “tele-mental” health in this policy brief), can best be described as “inconsistent,” “sporadic,” and “underutilized” within behavioral health and human service settings.¹⁷

The American Telemedicine Association (ATA) defines telemedicine as “the use of medical information exchanged from one site to another via electronic communications to improve a patient’s clinical health status.”¹⁸ Delivery of telemedicine services, including telepsychiatry and its overlapping cousins, teletherapy, telebehavioral health and telemental health, is typically broken into two categories: 1) synchronous or live interactive two-way communication with a behavioral health specialist using video conferencing, streaming media, internet, wireless communications, and other forms of telecommunications technology; or 2) asynchronous transmission of medical information that is not real time via text, email, chat, telephone or other forms of telecommunications from one site to another to be reviewed and responded to at a later time.¹⁹ More clinicians now offer their clients live video services combined with text, i.e., synchronous and asynchronous approaches.²⁰

For many people who live in rural areas or long distances from hospitals or clinics, and/or have limited availability of clinicians in their location, telepsychiatry provides a vehicle for them to receive consultation, diagnosis, and treatment from doctors and clinicians who could be far from their locale. It enables patients to remotely receive clinical assessments, as well as engage in ongoing treatment. Telemental health has also been utilized by patients who are incarcerated, or who reside in other access-restricted settings. Others who benefit are in urgent situations, or are otherwise unable or unwilling to meet a clinician in person. Telemental health has effectively been used in collaborative care models where primary care physicians take the lead in providing care, and use telehealth technology for a consultation by a mental health professional to more fully evaluate the patient.²¹

Telehealth has been one of the most studied newer technology-enabled approaches to care. Results of its efficacy similar or equal to in-person delivered services across the spectrum of care are well documented and reflect high consumer acceptance (even preference) over face-to-face encounters.²² Increasingly (but not consistently), telemental health sessions are covered through insurance²³ which makes them desirable to consumers. With costs for telehealth equipment dropping, coverage for telemental health services is on the radar screen of public and private payers. Regulatory relief from cumbersome licensure requirements is under way in many states. The widespread adoption of this well-researched technology-enabled service by behavioral health and health care providers systems has room to accelerate in the near future and holds much promise to greatly improve access to care.

Intelligent Machines in Behavioral Health Care

Artificial Intelligence (AI) is the field of science concerned with the study and design of intelligent machines that can enhance the quality, accessibility and efficiency of care, while also making available new capabilities in behavioral health services. AI technologies and techniques are already at work all around us, albeit often behind the scenes. They are employed in smart mobile devices (e.g., voice recognition software), mobile health applications that learn the pattern and preferences of users, and in internet web browsers. AI devices are used by consumers and by health care professionals in clinical decision making, testing, diagnostics, and care management.²⁴ AI can be in the form of hardware or software that can be stand-alone. It can be integrated into a network of solutions to provide a seamless experience for the consumer, or embodied in an intelligent agent (virtual or robotic) that is capable of interacting with its environment and making its own decisions.

Combining AI with remote monitoring and treatment technologies such as smartphones, wearables, and telehealth can achieve better diagnosis and treatment recommendations with less specialty labor and human effort. AI can also be used to reduce wait time for consumers to get help and to find help faster and more conveniently. Services can even be brought into the home in the form of virtual care providers or smart machine robots. One example of this can be found in older adult services where eldercare-assistive robots (i.e., smart machines that move semi-autonomously) perform specific tasks, and use sensors to understand their environments.²⁵

Proponents of AI technologies often espouse their advantages over health care services delivered by people. Such stated advantages include: 1) the ability to complete highly complex tasks with greater efficiency accuracy, and reliability than humans;²⁶ 2) lower susceptibility to fatigue, boredom, burnout or forgetfulness.²⁷ 3) patient perceptions as being immune to personal biases and feeling less judged;²⁸ 4) reports of lower anxiety levels when discussing intimate issues;²⁹ 5) potential to customize care based upon individual patient profiles by integrating data from other intelligent devices, such as wearable and biofeedback devices; and 6) capacity to adapt to specific aspects of a patient's culture such as race/ethnicity or socioeconomic status, e.g., a virtual-human clinician can customize mannerisms such as eye contact, speech dialect, use of

colloquialisms, and other characteristics to reflect a given cultural group, potentially enhancing patient rapport.³⁰

The varied uses of AI include:

➤ *Natural language processing*

The capability of machines to interpret and process human language is called “natural language processing” (NLP). NLP is a sub-field of AI that combines computer science with linguistics. NLP has many practical uses for behavioral health care. For example, NLP combined with “machine learning” (ML) can allow virtual humans to interact with people through text or voice communications. NLP is also used for scanning and semantic analysis of text and voice by analyzing treatment sessions and identifying patterns or content of interest. Combined with hardware and software to recognize images, sounds, touch and smell, NLP makes machines capable of recognizing human faces, language, gestures, and social signals to detect psychological distress cues.³²

➤ *Virtual and augmented reality*

Virtual reality (VR) is a human-computer interface that allows the user to become immersed within and interact with computer-generated simulated environments. Clinical virtual reality is the use of this technology for clinical assessment and treatment purposes, and it has been used in the treatment of various psychological disorders. Additional uses include the creation of virtual humans or other simulated life forms (e.g. virtual pets) that humans can interact with in virtual environments or on personal computers and mobile devices. For example, virtual human systems have been developed and tested to provide health care information and support,³³ improve medication adherence among patients with schizophrenia,³⁴ provide patients with hospital discharge planning,³⁵ and provide skills training for people with autism spectrum disorders.³⁶

Augmented reality (AR) combines virtual reality with the real world by superimposing computer-generated graphics with live video imagery. This technology allows information about the surrounding world of the user to be available for interaction and digital manipulation. It can be paired with GPS capabilities to provide real-time location data to the user and can be applied to mobile devices such as smartphones, tablet PCs, and wearable devices.³⁷ AR has been used in clinical settings helping children with autism to identify emotions from facial expressions,³⁸ reminding people to take medications on schedule, and creating virtual stimuli that provoke anxiety in a patient’s real-world environment during prolonged exposure therapy.³⁹

➤ *Affective Computing*

Affective computing focuses on emotion recognition by machines, emotion modeling, and the expression of emotions by robots and virtual agents. Affective human-computing interactions

(affective HCI) aims to develop machines that have the ability to detect, classify and respond to the user's emotions and other stimuli. It makes use of other technologies including sensors, machine learning, and natural language processes. An example of an affective detection system is the Defense Advanced Research Projects Agency (DARPA) Detection and Computational Analysis of Psychological Signals system that uses machine learning methods, natural language processes, and computer vision to analyze language, physical gestures, and social signals to detect psychological distress cues in military personnel.⁴⁰

➤ *Robotics*

The field of robotics has expanded its potential use for behavioral health care. As mentioned earlier, one example currently in use replaces animals used in animal-assisted therapies for patients with dementia.⁴¹ Recently, the FDA approved a robot for use in hospitals to maneuver between rooms to connect health care providers to patients via wireless video teleconferencing. In the future people may be able to seek behavioral health treatment directly from AI technology embodied in robots in provider settings or in the home.⁴²

For the most part, the AI technologies described above can be used to augment the work of professionals, enhance the care they provide to patients, and improve self-care options for persons seeking self-treatment or health-related information.

Infrastructure Technologies

➤ *Electronic Health Records*

Electronic health records (EHRs) are important tools for collecting, managing and sharing health care information within a digital technology environment. Smartphones, tablets, wearables, and other web-enabled devices and applications are transforming the way clinicians and consumers communicate and infiltrating multiple aspects of clinical practice and behavioral health service delivery. As consumers adopt mobile tools, and increasingly monitor psychometric functions on their own, behavioral health providers will face a growing need to track and monitor the information their patients collect. EHRs can facilitate a greater and more seamless flow of information within and across health and behavioral health care systems, and between clinicians and their patients.⁴³ These technologies have the potential to achieve better integration of patient data into complex health care workflow systems. They can also directly impact the economics of how care is compensated. With EHRs, information can be available about a consumer's health, history, and other treatments *all in one place*; however, their adoption in behavioral health settings has lagged far behind general health care. A recent survey found that while 97% of US hospitals and 74% of US physicians have implemented interoperable EHRs only 30% of behavioral health providers have implemented these systems.⁴⁴

➤ *Care Coordination*

Mobile and other technologies are influencing another aspect of health care service delivery, care coordination. Web-enabled patient portals offer more convenient ways for patients and clinician's offices to communicate. They can also streamline time-consuming care coordination functions, such as, appointment scheduling, transportation logistics, confirming that a service was delivered, or following-up on treatment plan recommendations. Care portals can facilitate consumer engagement by enabling health care providers to interact with consumers on their terms – no phone calls necessary. Examples of the many functions consumer portals can perform include: receiving instant updates in-between appointments; seeing lab results; downloading medical histories; setting, modifying, canceling, or rescheduling appointments. The ability of consumers to perform these tasks directly alleviates staff workload. Consumers can upload new health information for review by their care providers, including self-assessment results and physiological and behavioral data from wearables. Many clinicians are already communicating with consumers through SMS for appointment reminders, service updates, and other notices. Care portals can run through mobile devices and offer many new opportunities for consumer engagement.

Barriers to Adoption of New Technologies in Behavioral Health care

There are significant policy, structural, educational and attitudinal barriers to adoption of these new technologies in behavioral health care, and key concerns that impede the widespread adoption of technologically-based tools in behavioral health care. They include:

Research and Quality Standards

Technology-enabled tools and approaches to care have the potential to be effective and significantly improve treatment accessibility. Many, however, lack scientific evidence on their efficacy in managing or improving health and emotional well-being. Moreover, the sheer number of mHealth (apps) in the marketplace for behavioral health presents a significant challenge. Barriers related to ensuring quality standards and safety of technology-based tools for behavioral health, include:

- **Lack of oversight or national standards** to support industry claims of clinical efficacy for new behavioral health technologies.
- **Lack of rigorous testing and randomized controlled research** offer limited evidence by respected academic and research institutions or professional organizations supporting claims that technology-based tools improve behavioral health conditions. (Note: the FDA approved the first mobile medical app for substance use disorders in September 2017).
- **Direct-to-consumer marketing** by-passes input by traditional medical gatekeepers to help guide consumer choices.
- **Limited number of resources are available to guide consumers toward tools that are safe and effective** and which one(s) may work best for them among the myriad

- of apps and tools from which to choose.
- **No clear measures and certifications** from oversight institutions to guarantee that an app or a mobile device delivers credible content, contains safeguards for user data, or functions as described.
 - **Limited funding for third party review** by professionals or professional groups.
 - **Fast-paced growth of technology solutions** for health and behavioral health care is surpassing the ability to oversee clinical contents.

Data Security and Privacy

Data security and patient privacy requires careful consideration when integrating mobile technology and new technology innovations into behavioral health care. Although many smartphone-based medical apps use secure protocols, the wireless utilization of these devices opens up new vulnerabilities and uncertainties for behavioral health providers and consumers about personal and confidential information⁴⁵ that include:

- **Threats to patient privacy caused by physical loss of mobile devices.** Personal data, patient medical and psychiatric history, therapy session notes, contact numbers, addresses and sensitive information can be lost or compromised.
- **Unauthorized access by third parties ranging from cyber-criminals to bystanders and family members can result in significant risks to user confidentiality.** Many health apps gather demographic and medical information by asking users to enter personally identifiable data including: age, gender, location, phone number, user names and passwords. Additionally, these technologies often transmit physiological and behavioral data that could lead to unforeseen privacy and security risks in the wrong hands.
- **Patient information is often forwarded to software developers** or other companies for marketing research, and without the user's consent.⁴⁶
- **Passive monitoring services or "smart homes" that capture individuals' data without their knowing** raise personal privacy concerns.
- **Lack of provider awareness of laws and professional codes** as they apply to transmission and storage of confidential information on smartphones or other mobile electronic devices can jeopardize client privacy and consumer confidentiality.
- **Personal health information is of great value to cyber-criminals.** It can be used to obtain medical services and devices, or commit fraudulent acts in the victim's name. There are few legal protections. Even when a privacy policy is issued by the developer, once personal information goes public via social media, users have little or no control over it.

Education and Awareness

A significant barrier to adoption of technology-based approaches to assessment and treatment of

behavioral health conditions is the lack of understanding and awareness by consumers and practitioners of existing tools and interventions, and their potential uses and benefits caused by:

- **Availability of numerous similar and/or duplicative apps in the commercial market, causing confusion.** The sheer volume of choices in mHealth apps available in the absence of a mechanism for certifying or ranking them leaves providers and consumers on their own to navigate app selection. It can reduce consumer motivation, and deters providers in recommending their use.⁴⁷
- **Limited public and professional trust of new technologies** due to lack of unbiased scientific evidence of their contents, accuracy, and security by neutral public and private third-party organizations give rise to concern. Consumers and providers are demanding more accountability around technology innovation that is tied neither directly, or indirectly to the technology sector itself.
- **Limited awareness and understanding** by practitioners of consumers' behaviors, needs, desires, and lifestyles, and how new technologies can impact quality of life.
- **Stigma and fear associated with the use of some technology devices** due to their antiquated or theatrically-enhanced portrayals to the general public.
- **Fear of changing “tried and true” methods of care** and lack of confidence in the new technology by clinicians.⁴⁸
- **Competing interests among behavioral health stakeholders or between providers and consumers** can interfere in the uptake of technology innovations. For example, practitioners may be fearful of their impact on the job market, such as the elimination of jobs, or may fear technology-based devices diminishing the need for face-to-face therapeutic encounters. On the other hand, the empowered and engaged consumers of behavioral health care are a growing force as they demand greater access to diagnostics, services, and technology devices they consider helpful in managing their own health care.
- **Inability of new technologies to reach the most vulnerable cohorts of patients.** A benefit of new technologies is increased communication and instant access to patient information; however, older adult patients, those with language barriers, those who cannot afford or otherwise have limited or no access to new technologies are still underserved by the mHealth and technology marketplace.⁴⁹

Reimbursement

The slow-moving paradigm shift in delivery of behavioral health care and reimbursement processes still dictates that current approaches to care remain skewed to the traditional face-to-face encounter.⁵⁰ Limitations of reimbursement models by public and private payers are cited as one of the most significant barriers to the broader adoption of electronically delivered health and behavioral health solutions. This should change as clinicians gravitate toward using technologies for which they are directly, or indirectly compensated. Current barriers include:

- **Reimbursement policies by private health plans and Federal payers vary from state-to-state** allowing compensation for technology-based services that ranges from *no to lower* reimbursement for behavioral health care in comparison with levels of reimbursement using the same technology in general health care.
- **Numerous restrictions and limitations by private health plans and Federal payers** vary plan-to-plan and state-to-state in terms of the types of approved services eligible for reimbursement, who is authorized to deliver the service, and where the patient can be located at the time of the encounter.
- **Lack of parity in reimbursing technology-enabled services on par with face-to-face services** (e.g., a 60 minute psychiatric evaluation conducted in a practitioners office will be reimbursed at a higher level than same service of same duration by same clinician delivered through a technology-enabled device).
- **Lack of Federal standards to guide establishment of uniform reimbursement policies and methodologies** for tele-mental health, mHealth or other electronically-enabled interventions.
- **Lack of integration between digital health solutions and EHRs** to generate billings when a service is eligible for reimbursement.
- **Lacking or inadequate current procedural terminology (CPT) codes** for billing technology-based treatments and intervention.

Licensure and other Regulatory Issues

Regulatory barriers, especially related to licensing, are often cited as being on equal par with reimbursement challenges in expanding access to behavioral health care through accelerated adoption of technology advances. Similar to the patchwork of disjointed reimbursement methodologies that have hampered the adoption of new technologies, a web of complex state licensing and credentialing processes are equally problematic. Attention is now being paid to the regulatory barriers associated with tele-behavioral health implementation that can help inform similar modifications to licensing restrictions for the use of mHealth and other technologies in the future. These regulatory barriers include:

- **Provider licensure rules that vary** greatly state-by-state.
- **Requirements that providers must be licensed in the state where they are treating patients.** This is particularly problematic for providing care across state lines or in bordering states, if consumers are in prison or other restrictive practice sites, or in states like Florida that have few psychiatrists and limited licensed practitioners.
- **Obtaining and maintaining multiple licenses takes time and money.**
- **Credentialing and privileging issues** may arise if services involve two or more health care facilities, or a practitioner maintains privileges at several locations.
- **Electronic prescribing may be difficult due to varying state regulation** over the conditions necessary for e-prescribing using telehealth or other telecommunication

- devices.
- **Unresolved issues and concerns about malpractice liability** as it relates to practicing in the new telecommunications world, including practice standards and protocols, supervision, informed consent and the nature of physician-patient relationships are all sources of concern.

Ethical Standards and Liability

The ethics codes and guidelines of professional health care organizations require a professional relationship be maintained between the health care provider and patient. Ethics guidelines also caution professionals to do no harm. In mental health care, where highly emotional interactions can occur in the process, respect for the emotional vulnerability of patients in treatment is a requirement. Most of these codes were developed in the 1970s, well before the advent of AI infused virtual humans and intelligent autonomous care providers.⁵¹

Designers and end users of technology-based tools for behavioral health must consider the ethical obligations which arise in a therapeutic relationship, underscoring the importance of disclaimers regarding what the service to be provided is and isn't. This includes issues regarding the emotional bond between patients and providers and the expression and experience of emotions that can occur during the therapeutic process. With advances in affective sensing and computing that enable intelligent machines to interact with people in human-like, empathetic and caring ways, it is likely that a therapeutic relationship could be established between people and machines. Therefore, consideration must be given to the complications in a relationship between a patient and a virtual human or humanoid robot.⁵² Such concerns and other ethical issues need to be addressed by professional organizations, medical ethicists, and all those involved in the design and deployment of emerging technology tools that provide care to people.⁵³ These considerations include:

- **Professional ethical codes and guidance reviewed and updated on a continuous basis relative to the use of the most current technologies**, including AI, within the context of providing clinical treatment, and including the need to address any adverse therapeutic interactions with technology-infused devices.⁵⁴ (Note: Some professional organizations have implemented such a process, including the American Telemedicine Association).
- **Processes and grievance procedures must be broadly disseminated** by behavioral health professional organizations for consumers to voice concerns regarding patient safety, quality and clinical contents of technology-based devices, or adverse therapeutic impact of interactions with technology-infused devices should be developed and disseminated to consumers.
- **Lack of clarity regarding professional liability**, which can arise when self-assessment and self-monitoring data is sent to a clinician via an app-portal requiring immediate attention, but goes un-noticed resulting in patient self-harm. Provisions of professional liability coverage should be reviewed to ensure they adequately cover use of technology-

enabled devices used to deliver care and potential malpractice claims.

- **Professional users of technology-based clinical interventions have little knowledge and understanding of these devices**, including their capabilities, scope of use, and limitations of these devices.

Infrastructure Barriers

Electronic Health Records (EHRs) and Health Information Exchanges (HIEs) are critical tools for collecting, managing and sharing health care information. They also are critical for billing and reimbursement. Barriers to successful implementation of EHRs and HIEs in behavioral health settings include:

- **Inability to systematically capture or share structured, standardized and coded behavioral health information** makes it difficult to use EHRs to communicate with each other, i.e., lack of interoperability and siloed data.⁵⁶
- **Insufficient funding/lack of financial incentives to implement EHR systems in behavioral care settings.** The Health Information Technology for Economic and Clinical Health (HITECH) Act delivered over \$30 billion to general health care for EHR implementation with minimal incentives for behavioral health providers.⁵⁷
- **Lack of dedicated IT staff and resources hamper EHR implementation**, particularly when combined with insufficient provider training and proficiency using health information technology.
- **Diversity in size and locus of behavioral health service delivery impedes transmission and integration of electronic information.** Behavioral health clinical encounters often involve care delivered by a single practitioner in a private office, or outside the clinic in prisons, schools, and community organizations with limited access, or resources, to absorb the cost of EHR implementation.
- **Restrictions on sharing or exchanging behavioral health information between providers, and between providers and patients, particularly for substance use conditions, are complex.** Compliance with the Federal Confidentiality of Alcohol and Drug Abuse Patient Records regulations (42 CFR Part 2) is a significant concern and many EHR systems do not have the capacity to manage consents or control the re-disclosure of select information.⁵⁸
- **Limited connectivity between mHealth solutions and EHR systems impede communications between providers and consumers.** It also restricts the ability to integrate real time information seamlessly into clinical workflow for clinical decision making, use in patient care, and in reimbursement or receiving financial incentives for improved patient outcomes.⁵⁹

Recommendations

Vibrant Emotional Health offers the following recommendations to achieve wider adoption of

technology-based interventions, the most important of which is the need for research. If the application of behavioral health technologies is to facilitate safer and better outcomes, at lower cost, for people with behavioral health conditions, the significant gap in research must be addressed. Without so doing, policy reform is not possible. More research is needed to provide data on the usability and clinical effectiveness of technology solutions, to build professional and consumer confidence, and to provide a credible platform for implementing the recommendations that follow.

Position statements will be developed as specific proposals and opportunities for action emerge. Such actions will be guided by our recommendations and grounded in our deep commitment to ensure that any new technologies used to treat people with mental illnesses are effective and evidence-based.

Research and Quality Standards

- **Advocate for research to test the effectiveness of technology-based interventions through randomized, controlled trials.** Such research must be conducted by credible public and private institutions, including the FDA and integrated into product design.
- **Increase financial support from unbiased third-party entities** to fast-track reviews of new technologies and substantiate claims of safety and effectiveness.
- **Advocate for greater investment by the National Institutes of Health (NIH) and other funding bodies** to accelerate research, development and dissemination.
- **Develop national standards for evaluating effectiveness of mental health apps and devices** to establish guidelines for consumers and practitioners.
- **Advocate for increased funding opportunities to study the impact of peer support** on behavioral health outcomes and emotional well-being using mobile and web-based applications
- **Support continued research, development, and pilot use of AI technologies** to substantiate their safe use and ability to improve behavioral health outcomes.

Data Security and Privacy

- **Protect the privacy of a user's health data** through the use of built-in security protection features on mobile devices in accordance with the Health Insurance Portability and Accountability Act (HIPAA) when collecting, storing, or transmitting protected health information.
- **Engage professional societies to help increase awareness and understanding** of the data security risks and HIPAA requirements as behavioral health professionals integrate mHealth devices and other technologies into their practices.
- **Clearly define who owns user health data.** A balance must be struck between individuals' privacy safeguards and the quest for good evidence to drive health care.⁶⁰

- **Mandate health care providers to communicate with patients about privacy and data security risks** and discuss any potential perils that may arise from the use of mobile and other technologies. This information should then be presented to clients in an informed consent procedure that clearly states the benefits and risks.
- **Inform and educate consumers** about how their personal data is collected and the ways in which such data may intentionally be shared with third parties for marketing and other purposes.

Education to Increase Consumer and Practitioner Awareness

- **Promote clinician awareness on the use of technology-based interventions**, including artificial intelligence, and their potential integration with other technologies by engaging the assistance of professional organizations.
- **Urge the development of decision support tools** designed to match people to mental health apps, and to identify potential risk factors.
- **Educate the public about the benefits of mental health apps and other technology-based approaches** to boost consumer acceptance and comfort levels in using technology.
- **Disseminate guidelines for consumers and practitioners in identifying and selecting the best evidence-based apps for particular situations.**
- **Enhance provider proficiency in health technology use** by encouraging professional societies, licensing, and credentialing bodies to offer professional education programs on using new technologies in clinical practice.
- **Identify and publicize model centers that are delivering new treatment technologies** in local communities, and that are exemplifying the benefits of new technology-based interventions.
- **Target outreach and education to vulnerable or marginalized population groups** including older adults and those with language barriers who are underserved by the mHealth marketplace.

Financing and Reimbursement

- **Promote value-based payment as an overall concept.** The shift by public and private payers from fee-for-service payment models toward quality and performance-based approaches for reimbursement has significant potential to offer incentives to integrate technology-enabled tools into clinical practices and reduce concerns over reimbursement.
- **Ensure Medicaid, Medicare and private health insurance plans provide reimbursement for technology-enabled treatments by explicitly mandating their coverage.** Currently such coverage and reimbursement parity laws apply varyingly to private and public payer plans in each state where they exist.
- **Advocate for Congress to modify current Medicare and Medicaid payment**

- guidelines to expand coverage of telehealth services nationally.** Such Federal programs drive how states are able to serve senior and vulnerable populations.
- **Support bills currently under consideration to modify Medicare telehealth policy (e.g., the Medicare Telehealth Parity Act) to expand language on who can provide and receive telehealth services** (e.g., older adults and homebound disabled people), as well as expand the list of qualifying geographic locations.
 - **Advocate for parity for telehealth and evidence-based mHealth technologies.** Parity must be on two levels: service and payment. 1) if a technology-enabled treatment exists that is the same as an in-person treatment, it should be made available to all consumers; and 2) payment to providers who deliver the technology-based treatment must be at an equivalent rate as the same service delivered in-person.
 - **Encourage health insurance plans to develop programs that incentivize consumer use of mHealth apps** based on improved health and behavioral health outcomes.
 - **Establish additional CPT codes for billing technology-based interventions.**

Licensing

- **Advocate for cross-state licensing of clinicians in the provision of telehealth services.** At minimum, multi-state licensure compacts that ensure license equality across states, making it easier for behavioral health providers to deliver virtual services on an interstate basis. Licensing reciprocity will go a long way in eliminating an antiquated and cumbersome dual licensing requirements.
- **Support the American Telemedicine Association's position for the uniform inclusion of telehealth services in state licensure requirements.**
- **Encourage processes that streamline the credentialing procedure using a common set of requirements** to allow licensed clinicians to apply for credentials at many hospitals at one time through one application.

Ethical Considerations

- **Work with professional societies and other stakeholders to review and continually update guidelines and professional codes,** including provisions pertaining to the use of new technologies in behavioral health care. Professional organizations and regulatory boards must stay current with technological developments and take a proactive approach to address issues before they become problems.
- **Encourage increased professional education to convene programs on the appropriate use and limitations of using technology-enabled devices** in clinical practice.
- **Advocate for consumer protection organizations to establish ways for consumers to voice concerns regarding safety or quality of services** provided by or through

- technology-enabled devices, including virtual caregivers and other IA infused machines.
- **Advocate that end-users receive full disclosure by clinicians prescribing the use of mHealth and other behavioral health technology:** its purpose, its scope, where the information goes that is collected, communication protocols, and other key issues that should be considered over time.

Infrastructure Expansion

- **Increase availability of funding for behavioral health providers to implement EHR systems.**
- **Encourage technology developers to design EHR solutions that can accommodate behavioral health conditions,** comply with HIPAA requirements, and are affordable to providers ranging from individual practitioners to large medical groups.
- **Encourage development of EHR solutions that are able to integrate with mHealth data** to facilitate communication between consumers and providers.
- **Advocate for the development of more HIE software tools to improve interoperability between EHRs,** as well as for consumers to access most of their healthcare information in one place rather than from multiple providers.

Conclusion

Vibrant Emotional Health joins others in viewing the current failures of under-recognized and under-treated behavioral health disorders as both a human tragedy and a public health crisis and is committed to advancing the use of technologies in behavioral health care. We believe this rapidly advancing field presents numerous opportunities to exponentially increase access to services at lower cost for millions of people, as early identification, assessment and effective treatment are key to turning the tide on the ever-increasing economic and human costs of untreated mental illness. Technologically-based solutions have the potential to do all three.

Behavioral health care's movement into a digital future has lagged greatly behind general health care. Many of the tools and technologies have not been widely adopted despite their availability, promise, and high levels of interest by consumers and providers. Vibrant Emotional Health will advocate for the need to address the range of educational, ethical, reimbursement, and regulatory issues associated with the adoption of these emerging technologies - and the need to do it responsibly and collaboratively. Advocates, researchers, policy-makers, consumers, government, health and behavioral health care professionals and administrators, consumers, ethicists, technologists, engineers, entrepreneurs, professional societies, and other stakeholders must work together to harness the full potential of technologies for improving behavioral health. At the same time we must develop a framework for ensuring that technology solutions used in mental health care have appropriate oversight, and are backed by a substantial research base that support their use.

Vibrant Emotional Health’s Policy Briefing and Advocacy Agenda to Behavioral Health Technology aims to increase awareness of the issues involved and mobilize support to encourage all institutional stakeholders and payers to hasten efforts to accelerate the adoption of new technologies in behavioral health settings, and by the millions of people who lack access to mental health care. Using technology-based approaches to behavioral health *can* and *will* create numerous direct and indirect benefits, as well as opportunities to achieve emotional wellness.

We believe that we are on the cusp of an exciting new era for the behavioral health field. Some have called it a “brave new world.” Vibrant Emotional Health eagerly embraces the opportunities that technology can offer for the benefit of our constituents. We look forward to the challenge and will join others in leading the way.

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