How Internet Technology can Improve the Quality of Care for Substance Use Disorders?

Michael A. Cucciare*, Kenneth R. Weingardt and Keith Humphreys

Center for Health Care Evaluation, Veterans Affairs Palo Alto Health Care System, Stanford University School of Medicine, Menlo Park, CA 94025, USA

Abstract: By allowing for the efficient delivery of instructional content and the secure collection of self-report data regarding substance use and related problems, the Internet has tremendous potential to improve the effectiveness and accessibility of addiction treatment services.

This article discusses some of the ways in which Internet technology can facilitate, complement and support the process of traditional clinician-delivered treatment for individuals with substance use disorders.

Internet applications are being used to support a range of activities including (a) the assessment and feedback process that constitutes a central feature of brief motivational interventions, (b) the concurrent monitoring of individual level outcomes among patients who are currently enrolled in addiction treatment programs, (c) the continuing care and ongoing recovery of patients who have completed treatment, and (d) the delivery of clinical training in evidence based practices for addiction treatment providers.

This emerging body of literature suggests that addiction counselors and program administrators can enhance the quality of clinician-delivered treatment by incorporating internet applications into existing processes of care.

Internet applications provide an unparalleled opportunity to engage patients in the treatment process, incorporate real-time data into treatment planning, prevent relapse, and promote evidence-based treatment approaches.

Keywords: Internet, computer-technology, substance use disorders, evidence-based mental health practices, mental health recovery.

The Internet presents addiction treatment professionals with unprecedented opportunities to improve the effectiveness and accessibility of treatment services [1]. The same reasons why an ever increasing number of people choose to communicate, shop, bank, and otherwise conduct their business online (confidentiality, security, convenience, ease of use, 24 hour/7-day access) make the Internet an attractive mechanism for delivering innovative interventions for substance use disorders. In addition to benefiting from the generic advantages of Internet technology [2, 3, 4] the substance abuse treatment field has unique features that make it particularly well positioned to exploit Internet-based products and services. For example, the Internet provides a convenient means of generating the personalized normative feedback that constitutes the core of brief motivational interventions, allow providers to continuously monitor patient outcomes and intervene as necessary to prevent relapse, and to help geographically dispersed providers to receive high-quality training in evidence-based treatment practices.

This paper discusses some of the ways in which Internet technology can facilitate, complement and support the process of traditional clinician-delivered treatment for individuals with Substance Use Disorders (SUDs). In doing so, we have decided to exclude mention of guided self-help programs for problem drinking [e.g. 5, 6] which are covered in an excellent review by Marks, Cavanagh & Gega (2007) [7]. Also excluded are Internet-based indicated prevention programs focused on screening, detection and early intervention [8, 9] and programs that use the Internet solely as medium of communication between addiction treatment providers and their clients (e.g. "e-Therapy" or "e-Mental Health") [10]. We adopt the focus we employ here because integration of Internet technologies into clinician- delivered treatment has tremendous potential to facilitate the adoption of evidence-based mental health practices [11].

Internet applications that enable the secure collection of self-report data from substance using clients can be used to support a range of activities including; (a) the assessment and feedback process that constitutes a central feature of brief motivational interventions, (b) the concurrent assessment and monitoring of individual level outcomes among clients who are currently receiving treatment for substance use disorders, and (c) the continuing care and ongoing recovery of SUD patients who have completed face-to-face treatment. Internet technology can also be used to (D) support efficient delivery of clinical training in evidence-based practices for substance use disorder treatment. The purpose of this article to not to provide a comprehensive review on the this topic, but to briefly discuss and review the empirical literature that bears on each of these various applications, describe pilot research efforts that are currently underway in our research center, and identify promising directions for future work.

*Address correspondence to this author at the Center for Health Care Evaluation, VA Palo Alto Health Care System, 795 Willow Rd. (152), Menlo Park, CA 94025, USA; Tel: 650 493 5000, Ext. 22102;
E-mail: michael.cucciare@va.gov

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INTERNET TECHNOLOGY TO SUPPORT BRIEF MOTIVATIONAL INTERVENTIONS

Several comprehensive literature reviews show that face-to-face, brief interventions based on Motivational Interviewing are among the most efficacious interventions for treating substance use disorders [12, 13]. In their review of 361 well designed treatment outcome studies of treatments of alcohol use disorders, Miller and Wilbourne conducted Brief Motivational Interventions were among the treatments with the strongest evidence for efficacy for reducing alcohol use [13].

One defining feature of brief motivational interventions is the inclusion of a standardized assessment which is used to generate a detailed, personalized feedback report [1, 6]. Personalized feedback reports (PFR) typically consist of normative feedback that allows respondents to compare their self-reported frequency of alcohol use to that of others who share similar demographic characteristics (e.g., age and gender). Research has consistently demonstrated that this type of normative feedback can lead to significant reductions in alcohol consumption in diverse populations including college students and military personnel [14, 15, 16]. Information demonstrating that one's individual behavior is outside the norm (e.g. that one uses alcohol more than 90% of people their same age and gender) can create a desire to reduce alcohol use as measured by several different outcomes [16]. Research suggests that personalized feedback that includes normative data on alcohol use allows a person to compare their alcohol use patterns to more objective patterns of age matched peers. This, in turn, results in an adjustment in one's own personal standards of acceptable drinking, leading to changes in drinking behavior [17].

Within the framework of brief motivational interventions, personalized feedback can be used as a standalone intervention [18, 19] or as a central feature of face-to-face intervention designed to maximize the likelihood that clients will take positive steps towards reducing alcohol consumption [1, 20]. Table **1** lists some of the evidence-based brief interventions incorporating normative feedback, along with website addresses.

Prior to the widespread availability of the Internet, the process of generating a personalized feedback report was often time and labor intensive. Clinic staff would typically complete the assessment using paper and pencil survey instruments and enter the data into a proprietary software program to generate the report (a process that could take a week or more in some settings). Internet-based systems designed to support brief motivational interventions can dramatically increase the efficiency of this process. Clients can now complete the assessment on a secure Internet site from their homes, or in the clinic waiting room, and bring the completed report with them to their first session, thereby allowing the clinician to use session time more efficiently. Further, researchers have found that the process of completing Internet-based screening and brief assessment measures and receiving feedback can reduce hazardous drinking to an extent similar to that found for practitioner-delivered brief interventions to the general population [8, 9]. Thus, one might predict an additive effect for interventions that combine an Internet-based assessment and feedback protocol with face-to-face brief motivational intervention. Our team is currently evaluating such a combined approach to treatment as it is implemented throughout the Readjustment Counseling Service of the U.S. Veterans Health Administration.

INTERNET TECHNOLOGY TO SUPPORT CONCURRENT RECOVERY MONITORING

Several investigators are exploring the role of Internet based outcomes monitoring systems in improving traditional, face-to-face treatment for SUDs. Forman and colleagues [21] recently published a feasibility study evaluating Patient Feedback, a semi-automated performance improvement system that enables individual clinicians to obtain real time feedback on measures of therapeutic alliance, treatment satisfaction, and substance use from currently enrolled outpatients. The authors found that it was feasible to implement a technology-based treatment monitoring system in actual clinical settings, but concluded that modifications to their system would be necessary to enhance any potential clinical usefulness.

Building upon this success, investigators in our research center have developed an Internet-based system to provide clinicians in the U.S. Veterans Health Administration with real-time aggregate feedback regarding therapeutic alliance, drug/alcohol use and cravings, and current problems from clients in group treatment for substance use disorders. Clients in SUD treatment complete a single page assessment after each couseling session. The assessment includes modified items from the short self-report form of the Addiction Severity Index [22], substance use and mutual help group attendance, and a satisfaction and therapeuetic alliance scale (CALPAS) [23]. These data are then transmitted *via* secure fax from the clinic to our research center where they are automatically scanned into a software program that uploads them to a secure Internet database. These data are then aggregated at the level of treatment groups, and graphically displayed to participating clinicians on a password protected website using an automotive

Table 1. List of Evidence-Based Interventions Incorporating Normative Feedback

Author/Agency	Website
Hester *et al*., 2005 [25]	www.drinkerscheckup.com
Join Together/Boston University	www.alcoholscreening.org
U.S. Department of Defense (see controlling alcohol and drugs module)	www.afterdeployment.org
The Down Your Drink Team, University College London	http://www.downyourdrink.org.uk
San Diego State University (e-CHUG)	http://www.e-chug.com/

Fig. (1). The clinician dashboard.

dashboard theme (Fig. **1**). The attractive and user friendly design of the Clinician Dashboard was the result of extensive usability testing with practicing SUD counselors, and is expected to enhance the clinical utility of the system. The investigators are currently in the process of pilot testing the application in a VA SUD treatment program in the San Francisco Bay Area.

The Patient Feedback and Clinician Dashboard systems are consistent with the concurrent recovery monitoring model [24], which evaluates the treatment of substance use disorders from an ongoing, during-treatment perspective, much as physicians regularly monitor the progress of treatment for diabetes, hypertension, or asthma. This approach suggests that traditional patient-level behavioral outcomes should be collected immediately and regularly by clinicians at the beginning or end of each addiction counseling session, as a way of evaluating recovery progress and making decisions about continuing care. By facilitating the routine collection, aggregation and reporting of such patient level data, Internet technology has the potential to enable clinicians to be more proactive, providing them with the information necessary to intervene with clients who are at immediate risk of relapse or other adverse consequences.

INTERNET TECHNOLOGY TO SUPPORT CONTINUING CARE AND ONGOING RECOVERY

Supporting the continuing care of clients leaving SUD treatment often presents considerable logistical challenges [25]. The Internet provides clinicians with an unparalleled opportunity to remain engaged with clients after completion of face-to-face treatment. The U.S. Veterans Health Administration is designing a system called My Recovery Plan, which will allow veterans who are currently engaged or have recently completed an episode of addiction treatment to organize and track all of the information relevant to their recovery. More specifically, My Recovery Plan will allow patients to monitor and track the type and degree of symptoms they experience, progress towards achieving individualized recovery goals such as obtaining stable housing or employment, and their success in following individualized plans for coping with relapse triggers. This application will also support the delivery of interactive educational content to promote the sustained adoption of the skills acquired during treatment

My Recovery Plan is part of a U.S. Veterans Health Administration initiative to provide all of its patients with access to a secure Personal Health Record [26]. This

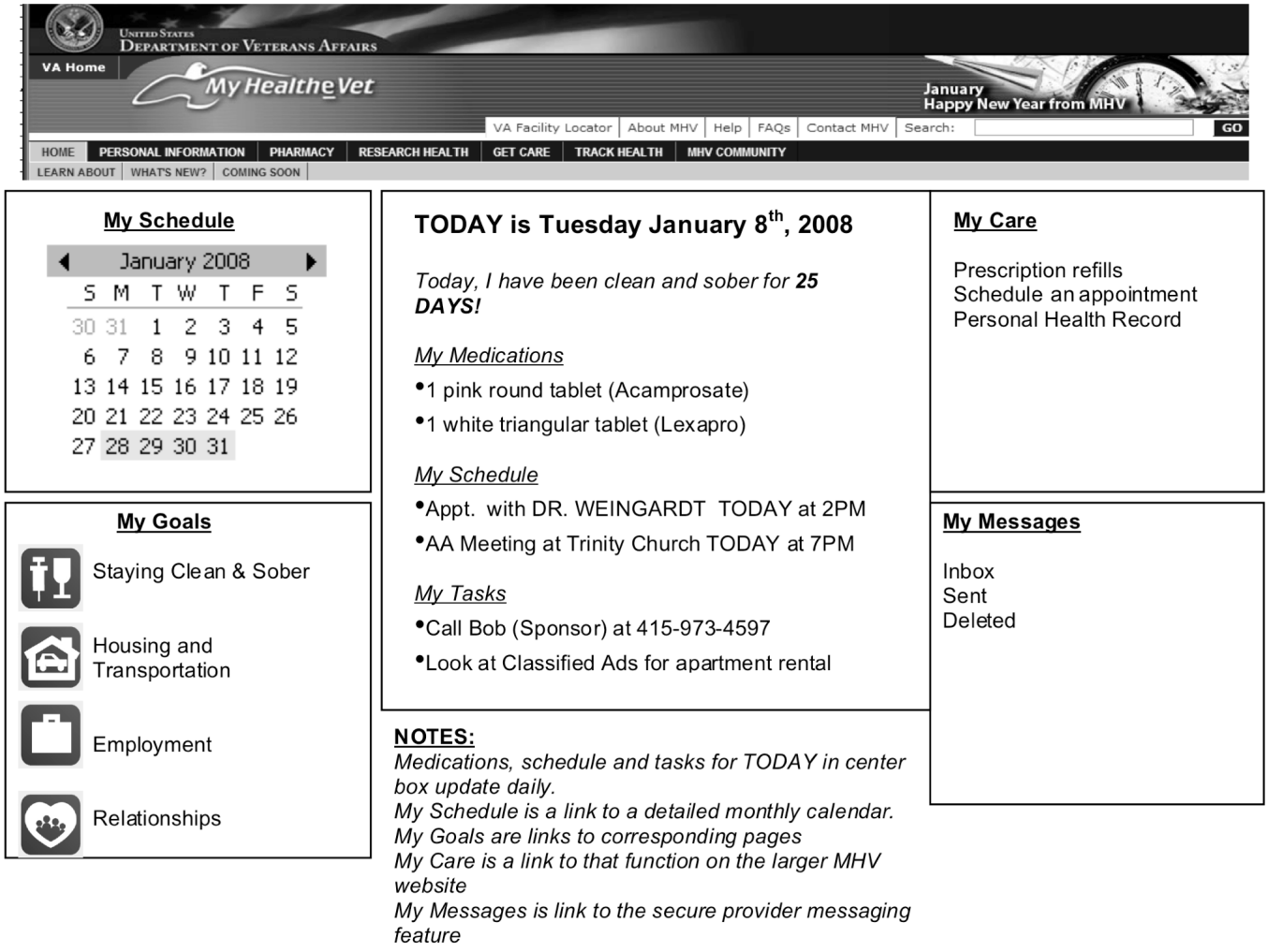

Fig. (2). Prototype of goals module in my recovery plan.

personal health record, known as My Health*e*Vet (www.myhealth.va.gov) provides veterans with access to trusted health information, links to benefits information and resources, and online prescription refills. Planned new releases of this system in 2008 will allow patients to view appointments, send secure messages to their health care providers, and view key portions of their electronic medical record. Since November of 2003, My Health*e*Vet has been visited over 15 million times by over 500,000 registered users.

My Recovery Plan will capitalize on many of the existing features of the My Health*e*Vet platform, and develop sophisticated new features to help individuals with mental health and substance use problems to get the most out of the traditional clinical services they receive, and to maintain their gains once they have completed a formal treatment episode and have returned to the community (Fig. **2**). My Recovery Plan is designed to be used within the context of an established clinical relationship, rather than as a stand alone intervention. Although My Recovery Plan will ultimately serve patients with a variety of mental health problems including Schizophrenia and Post-Traumatic Stress Disorder, the present discussion focuses on how this application will support VA patients who are receiving specialized treatment for SUD.

1. Recovery Planning Goals

My Recovery Plan will allow patients who are receiving SUD treatment to establish, manage, and track goals that are important to their individual recovery. Recovery here refers to the "journey of healing and transformation enabling a person with a mental health problem to live a meaningful life in a community of his or her choice while striving to achieve his or her full potential" [27]. By definition, the recovery process must be self-directed by the individual, who defines his or her own life goals and designs a unique path towards those goals. In keeping with this paradigm, My Recovery Plan is being designed to guide the patient through the process of identifying specific recovery goals (e.g. live independently, find gainful employment), specifying how they are presented, and defining their strengths, values, and any potential barriers toward goal attainment. Once a set of goals has been identified, the system helps the user to identify smaller tasks that need to be accomplished in service of each goal, and assign these tasks a deadline.

2. Monitoring Symptoms, Functioning and Quality of Life

In keeping with the concurrent recovery monitoring model [24], My Recovery Plan will allow patients in addiction treatment to continuously track their SUD

symptoms, quality of life, and level of functioning. Patients will interact with its easy-to-use interface to access psychometrically sound assessment tools, which will provide them the opportunity to determine which aspects of their condition they would like to track and how often. For example, patients may choose to track cravings and urges to use alcohol and other drugs. They will also have access to evidence-based assessment instruments for identifying symptoms of psychiatric conditions that commonly co-occur with SUDs such as depression (e.g., Beck Depression Inventory) [28] and Post-Traumatic Stress Disorder (PTSD Checklist) [29].

3. Managing Addiction-Related Pharmacotherapy

My Recovery Plan will also provide patients with interactive, web-based tools to manage their medication use. This will include applications that help patients monitor medication adherence, track potential side effects, and to identify and implement strategies to reduce and manage undesirable medication effects. Patients will also be able to access printable educational materials and general principles of evidence-based use of medications for treating SUDs such as naltrexone [30] and acamprosate [31] for alcohol-dependence and buprenorphine and methadone for opiate addiction [32].

4. Delivering Interactive Content

Many evidence-based practices in the treatment of substance use disorders (particularly those in the cognitive-behavioral tradition) are information-intensive and regularly require patients to complete homework assignments outside of counseling sessions. My Recovery Plan will use the personal health record to provide convenient and secure access to didactic information and interactive exercises designed to complement face-to-face counseling sessions. Guided self-help materials will be presented in the form of online, self-help workbooks and allow the patient to receive ongoing feedback regarding their progress through these materials. Interactive content will be provided in various subject specific modules such as managing triggers and relapse to substance use, identifying and managing unhelpful thinking patterns related to SUDs, and evidence-based strategies for managing common comorbid psychiatric conditions (e.g., PTSD). Patients will receive regular and on-going feedback regarding their progress in the form of graphs, diagrams, and status completion bars.

INTERNET TECHNOLOGY TO SUPPORT CLINICAL TRAINING IN EVIDENCE-BASED PRACTICES

Much as My Recovery Plan uses the Internet to efficiently deliver dynamic, highly individualized instructional content to patients, related Internet applications can deliver high quality clinical training to addiction treatment providers. Technology based training is a particularly attractive vehicle for delivering clinical training regarding evidence-based practices, can be designed to complement both traditional face-to-face clinical training workshops and online client self-help materials, and can be conducted at lost cost with geographically dispersed clinicians [33].

Two recent studies have demonstrated the efficacy of self-paced (asynchronous) online training in Cognitive Behavioral Therapy for SUD treatment providers. In a study of 78 community-based SUD treatment providers, Sholomskas, Syracuse-Siewert, Rounsaville *et al*. [34] found that providing access to a CBT training website improved therapist adherence to the CBT treatment model more than did a treatment manual alone. Weingardt, Villafranca & Levin [35] compared the learning outcomes achieved by 166 practicing substance abuse counselors who were randomized to either a web-based training condition, a face-to-face workshop, or a delayed training control condition. Improvements in test scores for participants in both the WBT and face-to-face conditions were statistically significant and of similar magnitude.

We recently built upon this work by combining our asynchronous CBT course with virtual supervision sessions using a blended training approach. Blended training typically involves an asynchronous technology-based delivery mechanism such as a Internet-based course, video or website, coupled with a synchronous interaction between trainers and students that takes place *via* a traditional face-to-face workshop, or conferencing *via* telephone, video, or the Internet [33, 36]. By using self-paced Internet-based training to deliver background knowledge, and then using synchronous interaction with the instructor as an opportunity to build skills, such a blend leverages the relative strengths of both training delivery mechanisms [37]. Furthermore, this type of blended training intervention is consistent with the empirical literature on disseminating evidence-based practice in substance abuse treatment, which suggests that follow up contact (e.g. ongoing coaching or supervision) significantly enhances change in practice behavior [38, 39]. In the future, we hope to add a feedback component to our blended training interventions that will allow clinicians to securely upload video clips of clinical sessions and obtain feedback on their performance from expert supervisors.

SUMMARY AND CONCLUSION

In this article, we discussed some of the ways in which Internet technology is being used to enhance the quality of traditional clinician-delivered treatment for individuals with SUDs. For example, by supporting the secure collection, aggregation and graphical presentation of data regarding substance use and related problems, the Intern*et al*lows clinicians who conduct brief motivational interventions to spend counseling sessions focused on discussing personalized feedback in a way that may help clients take steps towards change.

Next, we discussed some of the ways the Internet can be used to support the real-time collection of individual level outcomes data from patients currently enrolled in addiction treatment, thereby providing clinicians with the opportunity to proactively intervene with patients who are at high risk of relapse or other adverse consequences. Internet applications such as My Recovery Plan may further help patients who have recently completed addiction treatment to remain abstinent and to make progress towards valued life goals such as finding a job or a place to live. Finally, we argue that Internet technology can play a critical role in efficient

delivery of effective clinical training in evidence-based treatment for SUDs.

Despite the growing popularity of integrating Internet technology into the delivery of evidence-based clinical services, and the various advantages that may accrue to SUD clinicians who use such technologies, several investigators have raised concerns about this approach [11, 2, 4]. Specifically, some critics might argue that technology-based mental health services may eliminate common factors of therapeutic success such as therapeutic alliance, empathy, and/or important nonverbal cues. However, research has shown that important interpersonal components of face-to-face treatment delivery are not necessarily lost when using Internet technology [40, 41]. In addition, some may have concerns that that using the computer to deliver mental health interventions can result in higher dropout rates when compared to face-to-face intervention. Although, some research has found this to be the case [42], we hypothesize that the type and degree of clinician involvement may affect dropout rates. For example, one might predict that the more tightly integrated the technology is to face-to-face treatment services, the higher the likelihood that clients will remain involved in the treatment process, which has some support from the available research [43].

These concerns are not tri*via*l and highlight some of the potential limitations of Internet and computer technology in the delivery of mental health interventions. It is for these reasons we advocate for the integration or "blending" [36] Internet treatment applications into face-to-face evidence-based approaches for treating SUDs (as well as other common psychological problems).

Key Learning Objectives:

- This article discusses some of the ways in which Internet technology can facilitate, complement and support the process of traditional clinician-delivered treatment for individuals with substance use disorders.
- By allowing for the efficient delivery of instructional content and the secure collection of self-report data regarding substance use and related problems, the Internet has tremendous potential to improve the effectiveness and accessibility of addiction treatment services.
- An emerging body of literature suggests that addiction counselors and program administrators can enhance the quality of clinician-delivered treatment by incorporating internet applications into existing processes of care.
- Limitations to integrating Internet technology into mental health service delivery may include higher dropout rates and a reduction in common factors of therapeutic success.

Future Research Issues:

- Does integrating Internet-based assessment and feedback protocols with face-to-face to care improve outcomes for persons with SUDs?
- How should recovery-based Internet applications (e.g., My Recovery Plan) be integrated into care to maximize patient outcomes?
- Does integrating a performance feedback component to Internet-based CBT training protocols (for SUD counselors) improve patient outcomes?

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