Improving Addiction Treatment through New Technologies

Disseminating a blueprint for the addiction treatment system of the future

SUMMARY

From 2005 to 2007, researchers at the Center for Health Enhancement Systems Studies at the University of Wisconsin-Madison launched Innovations for Recovery, an initiative to explore how information technology can improve treatment and recovery programs for people who suffer from substance abuse and dependence. In 2008, in a related project, the center examined the potential of a popular Web-based virtual world to enhance recovery outcomes.

Key Results

- Created the Innovations for Recovery (IFR) Network prototype. Using a combination of mobile technology and Web-based applications, the model illustrates how people in recovery can have anytime, anywhere access to six core services: social support, virtual counseling, education and training, location tracking, assessment and alerts.

- Crafted an interactive website (*innovationsforrecovery.com*) that uses streaming video and flash animation to demonstrate how the prototype works. The site provides other information about how technologies, such as smartphones and Web-based databases, can improve services to patients in recovery from substance abuse.

- Convened a two-day meeting of eight leaders in addiction treatment to discuss how the Internet-based virtual world, Second Life, can augment traditional addiction treatment programs. An online report summarizes the meeting findings.

- Obtained two federal grants to follow through with the recommendations.

Funding

The Robert Wood Johnson Foundation (RWJF) supported these projects with two grants: $84,998 for the Innovations for Recovery initiative and $48,983 for the meeting to assess Second Life. Both grants went to the University of Wisconsin-Madison Center for Health Systems Research and Analysis, now called the Center for Health Enhancement Systems Studies.

THE PROBLEM

Nearly 20 million people in the United States have substance abuse or dependency issues, but only a fraction of those, 3.9 million, receive treatment, according to statistics from the federal Substance Abuse and Mental Health Services Administration. Despite numerous advances in the treatment of addiction, relapse to heavy or uncontrolled substance use remains common—sometimes as high as 80 percent, according to sources cited by the Center for Health Enhancement Systems Studies.

One way to improve these outcomes is to use information technology—such as Web-based applications—to augment treatment by providing information and support to people 24 hours a day during recovery.

To explore this potential, RWJF provided the Center for Health Enhancement Systems Studies with funding to convene the Addiction Treatment Vision Panel, which brought together futurists and experts in information technology and addiction treatment. At two intensive retreats in November 2004 and May 2005, the panel explored the application of technological innovations to the diagnosis and treatment of substance abuse disorders. See Program Results Report on ID# 049911 for more information.

Also see Appendix 1 for a summary of ideas from the Addiction Treatment Vision Panel; see Program Results Report on the project.

CONTEXT

RWJF, which had a track record of significant support for substance abuse education and prevention efforts in the 1990s through programs such as *Fighting Back* and *Reducing Underage Drinking through Coalitions,* invested in improving the quality of the treatment systems starting in about 2002.

According to RWJF president, Risa Lavizzo-Mourey, M.D., M.B.A., the focus on treatment was needed because of "the tremendous gap between what we know about the treatment of substance abuse and addiction and what is actually done in health care settings." (*Advances,* Issue 1, 2003). This project is part of that work. RWJF also invested in:

- *Resources for Recovery: State Practices that Expand Treatment Opportunities.* The program was designed to help states expand their substance abuse treatment systems through more efficient use of existing resources and funding streams. See Program Results Report for more information.

- *Paths to Recovery: Changing the Process of Care for Substance Abuse Program.* This program focuses on strengthening the addiction treatment system's ability to successfully use process improvement techniques toward increasing patients' access

to and retention in addiction treatment programs. See Program Results Report for more information.

- *Advancing Recovery: State/Provider Partnerships to Quality Addiction Care.* This program supports partnerships between treatment provider organizations that deliver care and states that are in the unique role of being both the largest purchaser of publicly funded treatment services (70 percent) and regulators and licensers of those services. The project would use known leverage points at the state and provider organization levels to overcome barriers to proven practices and increase their use. See Program Results Report for more information.

Since 2005, RWJF has focused its addiction treatment funding on projects that could impact the most vulnerable populations.

THE PROJECT

Innovations for Recovery

From November 2005 through July 2007, researchers at the Center for Health Enhancement Systems Studies extended the work of the Addiction Treatment Vision Panel by launching the Innovations for Recovery initiative. The three objectives of this project were:

- Stimulate awareness and interest in testing technology-based systems to support addiction treatment and recovery.

- Create a complementary prototype system.

- Communicate these interests to attract public and private support.

The Center for Health Enhancement Systems Studies focuses on improving health and quality of life through organizational and individual change projects and research. It consists of two primary initiatives whose resources combined to support Innovations for Recovery:

- The Comprehensive Health Enhancement Support System (CHESS™), which creates computer-based software to give people in the midst of a health crisis access to educational material, virtual support groups and other services.

- NIATx is a partnership between the Robert Wood Johnson Foundation's *Paths to Recovery* program, the Center for Substance Abuse Treatment's Strengthening Treatment Access and Retention (STAR) program, and a number of independent treatment organizations. It also manages RWJF's *Advancing Recovery* program.

Researchers launched the project by gathering feedback to follow up on the Addiction Treatment Vision Panel's ideas about technology's role in substance abuse treatment. They conducted four focus groups at substance abuse agencies in Peoria, Ill., and Boston

in 2005. Two of the groups included counselors, primary care providers and criminal justice workers, and two others included patients and their families. Some 80 people participated in the four groups.

Through the focus groups, researchers found that patients did not want personal contact information available to other users of a virtual community; treatment counselors did not want virtual connections with their patients to replace office appointments.

At the same agencies, the researchers also distributed a written survey to patients, their families, counselors, and child welfare and criminal justice personnel to prioritize the needs of people who are in recovery from substance abuse and dependence. A total of 97 people responded to the written survey. See Appendix 2 for findings from the survey.

Using the information culled from the focus groups and survey, a panel of experts in Web-based technology created a prototype of a system that would allow patients in recovery to tap into support through Web-based applications.

Virtual Reality in Addiction Treatment: Second Life

Under a related project, the team explored ways in which a Web-based virtual world, Second Life, can be used in treatment of substance abuse to help those in recovery practice coping skills or attend virtual meetings or counseling sessions. Launched by Linden Lab in 2003, Second Life is accessible without charge via the Internet. It enables users, called residents, to interact with each other through alter-egos or avatars.

The Network for the Improvement of Addiction Treatment held a two-day meeting on May 29–30, 2008, with eight leaders in the field of addiction treatment and recovery. During the first day, panelists went online to gain first-hand experience with Second Life. On the second day, they discussed ways in which Second Life can play a role in addiction treatment as well as potential barriers to using the website.

RESULTS

The researchers at the Center for Health Enhancement Systems Studies accomplished the following:

- **Created the Innovations for Recovery (IFR) Recovery Network Prototype to illustrate how Web-based technology can give people in recovery access to virtual support anytime, anywhere.** The prototype is built around electronic health records. Using passwords to protect their privacy, stakeholders access databases through a patient portal (gateway). The prototype includes the following integrated services:

  — Social support

- — Virtual counseling

- — Education and training

- — Location tracking

- — Assessments

- — Alerts: appointment reminders and warnings about risky situations

- **Crafted an interactive website—*innovationsforrecovery.com*—to demonstrate the prototype and provide other information about the potential of technology to improve relapse-prevention services.** The site uses streaming video and flash animation to illustrate how the prototype works.

- **Purchased and field tested cutting-edge devices to assess their potential for integration into a technology-based system for improving aftercare services for people in addiction treatment.** Research team members tested:

  - — *iPods:* Researchers organized and downloaded pre-existing podcasts focused on recovery-related topics, with content ranging from music and short inspirational messages to educational material.

  - — *Biomonitors:* Researchers assessed the potential of SenseWear, a device developed by BodyMedia, a designer of wearable body monitoring products and services. Two team members used SenseWear armbands to track physiological indicators of anxiety and stress, which often lead to relapse for people with substance abuse and dependency issues.

    - Based on their small field test, researchers concluded that the devices were not yet sensitive enough to distinguish between positive emotions, such as elation after participating in a fun activity, and negative emotions, such as depression after a fight with a loved one.

  - — *Mobile phones:* Researchers explored using "smartphones" with next-generation hardware and software to deliver the Innovations for Recovery intervention.

  - — Based on these field tests, the researchers requested federal and private foundation grants for more extensive assessments of the use of iPods and mobile phones in technology-based recovery programs. See Afterward for details.

- **Published two trade magazine articles to stimulate interest in the potential of technology to improve addiction treatment outcomes.** These articles focus on the pros and cons of biomonitors and describe the team's experience with the SenseWear devices.

  - — "Can New Technologies Prevent Relapse," in *Behavioral Healthcare* (June 2006). Available online.

- — "Wearing Recovery on One's Sleeve," in *Addiction Professional* (May/June 2007). Available online.

- **Summarized ideas from the two-day meeting on Second Life in a report,** *Exploring the Potential of the Web-based Virtual World of Second Life to Improve Substance Abuse Treatment Outcomes*. The report provides:

  - — A synopsis of the most popular ideas for using Second Life generated by the eight addiction experts. Examples of these were:

    - Launching a "Recovery Island": A network of organizations involved in treatment of substance abuse could rent space within Second Life's nonprofit island, allowing people's avatars to attend virtual support-group meetings or therapy sessions.

    - Creating personalized virtual worlds for patients: Counselors could design replicas of patients' real-life world including bars, offices and stores. This would allow patients to practice new coping skills in an environment that is just like what they face in their daily lives.

  - — An analysis of the technical, social, financial and ethical/legal barriers that patients and counselors would have to overcome to participate. Examples of these were:

    - Patients and counselors need to be willing to invest at least two hours to learn how to create and manipulate avatars in Second Life.

    - Counselors would have to verify if they are licensed to practice in the geographic location in which their virtual patients live in real life.

CONCLUSIONS

The report on Second Life concluded:

- "Most meeting participants felt that there was significant potential for using systems such as Second Life to improve substance abuse treatment outcomes." However, "for some participants, there were certain fundamentally unappealing aspects to Second Life itself."

- "The level of interest coincided with a reserved optimism that there were particular strengths and unique opportunities for treatment and recovery that look only to expand as society becomes increasingly 'plugged in' and familiar with innovative options in virtual reality environments such as Second Life."

AFTERWARD

The Center for Health Enhancement Systems Studies received three federal grants to continue the work of Innovations for Recovery:

- In 2008, the National Institute on Alcohol Abuse and Alcoholism awarded a five-year, $2.8-million grant to the Center for Health Enhancement Systems Studies to conduct a randomized clinical study on whether a mobile phone-based, virtual support system reduces rates of relapse among people in recovery from alcohol dependence.

  Study participants will use smartphones to access core elements of the Innovations for Recovery prototype, including access to peer support groups and addiction experts, reminders and individualized information to support recovery.

- In 2007, the National Institute of Nursing Research awarded a five year $2.4-million grant to the Center for Health Enhancement Systems Studies to conduct a study on whether a model personal digital assistant could improve asthma control for low-income inner-city youth with moderate to severe asthma.

- In 2008 the National Cancer Institute awarded $8 million to the university to be one of four Centers of Excellence in Cancer Communication Research. One of the three major research projects being supported is developing and testing the potential of a system similar to Innovation for Recovery to support patients recovering from colon cancer and to particularly encourage exercise in those patients.

In addition, the Wisconsin Alumni Research Foundation awarded the center a $20,000 grant in December 2008 to run a pilot test on whether a compendium of podcasts culled from the Internet on topics related to substance abuse are helpful to patients of the William S. Middleton Memorial Veterans Hospital in Madison, Wis.

APPENDIX 1

A New Future for Addiction Treatment: Ideas from the Addiction Treatment Vision Panel

In 2004 and 2005, RWJF provided the Center for Health Systems Research and Analysis with a grant (ID# 049911) to convene an expert panel and conduct a series of meetings to explore the application of technological innovations to the diagnosis and treatment of substance abuse disorders.

The first meeting was an intensive two-day retreat held in Chicago in November 2004 that brought together 28 experts charged with envisioning a new future for addiction treatment that would use the latest available technology. Panel members included addiction professionals; futurists specializing in pharmacology, biomedical engineering and other fields; and current or former addicts or alcoholics.

Retreat leaders employed creative techniques to help free up thinking beyond incremental improvement ideas. Through this process the panel generated eight idea categories that visualized future treatments for addiction using technology. They were:

- Integrated systems and records.

- Monitoring/treatment devices capturing an addict's moods, triggers and other risk factors.

- Virtual experiences.

- Treatment access and "one-stop shopping," providing a variety of addiction service locations.

- Networks enabling addicts and alcoholics to use computer programs to contact other people similar to them in age and background.

- Tailored media campaigns using personalized messaging and radio frequency identification to detect a possible risk for relapse and dissuade people from drug or alcohol use.

- Diagnostic tools.

- Help for families, including means to track family members' health and emotional status.

For more detail on this retreat, see the chapter "Automating Addiction Treatment: Enhancing the Human Experience and Creating a Fix for the Future," by David Gustafson et al., in *Future of the Intelligent and Extelligent Health Environment*. Also see Program Results Report on the project.

APPENDIX 2

Top Needs of Patients in Recovery From Substance Abuse and Dependence

- Understand what addiction really is.

- Know how to stop a relapse.

- Be prepared to function in society after treatment.

- Access to individualized treatment.

- Motivation to stay in treatment.

- Choose a treatment most likely to succeed.

- Improve ability to resist temptation.

- Know the things that make one vulnerable to relapse.

- Know the warning signs of impending relapse.

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www.innovationsforrecovery.com. Website of the Innovations for Recovery initiative includes information and an interactive demonstration of the Innovations for Recovery (IFR) Network prototype designed to delivery anytime, anywhere relapse-prevention services using mobile technology such as a smartphone.