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Making the hard work of recovery more attractive for those with substance use disorders

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Abstract

Background—Research has led to improvements in the effectiveness of interventions for substance use disorders (SUD), but for the most part progress has been modest, particularly with regard to longer-term outcomes. Moreover, most individuals with SUD do not seek out treatment.

Argument/analysis—This paper presents two recommendations on how to improve treatment engagement and long-term outcomes for those with SUD. First, treatments should go beyond a focus on reducing or eliminating substance use to target greater access to and more time spent in experiences that will be enjoyable or otherwise rewarding to clients. Second, there must be sufficient incentives in the environment to justify the effort needed to sustain long-term abstinence for individuals who often have limited access to such incentives.

Conclusions—To increase rates of long-term recovery from substance misuse, treatments should link clients to reinforcers that will make continued abstinence more appealing. This work needs to extend beyond interventions focused on the individual or family to include the local community and national policy in an effort to more strongly incentivize longer-term recoveries.

Keywords

substance use disorders; treatment; long-term recovery; incentives; community; national policy; motivation; debate

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We have seen a number of exciting recent developments in the quest to improve treatment outcomes for substance use disorders. There are several efficacious medications for alcohol and opioid dependence, interactive software has been developed to deliver behavioral interventions via computer (1–5), and mobile recovery support smartphone applications have been developed that provide a range of automated services 24/7 (6). Work on identifying mechanisms of cognitive and behavioral change has led to a greater understanding of how treatments work (7). Findings from genetics and neuroscience have the potential to increase our understanding of the biological and neurocognitive underpinnings of addiction and may lead to the development of new treatments (8,9).

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The news is not all good, however. A number of reviews and meta-analyses have found that cognitive behavioral therapy (CBT) and motivational interviewing (MI) do not appear to be much more effective than other active interventions (10–14). Medications for alcohol use disorders are not prescribed very much, and clients appear to have little interest in them (15,16). Research on mechanisms of change has not yet led to significant improvements in the efficacy of treatment. Neuroscience has produced a great number of intriguing findings, but no real advances in treatment to this point. In my area of research, continuing care, there have been disappointments as well. A recent meta-analysis found significant but small effects for continuing care interventions vs. no continuing care (17).

One could certainly argue that my interpretation of the research literature is too bleak, and conclude that we have made greater progress in our quest to improve the efficacy of SUD treatment. However, it is hard to argue that all this work had dramatically improved rates of *sustained* abstinence and recovery (18–19). Moreover, in any given year only about 10% of those with substance use disorders receive any SUD treatment, with more than 95% of the untreated individuals indicating they do not need or do not want treatment (20). In the small numbers of clients who initiate pharmacotherapy for alcoholism, sustained compliance rates are low (15). Evidently, many people with SUD do not really want the treatments we have to offer and derive only limited long-term benefits from them. Two exceptions to this general trend are opiate agonist medications and contingency management, which are very popular with clients. Not surprisingly, these interventions have high retention rates and consistently produce relatively large effects (21,22).

So what are we to make of this state of affairs? One possibility is that our treatments focus too much on reducing substance use, and not enough on linking clients to reinforcers that will make abstinence more appealing. The effectiveness of almost all interventions for SUD is dependent on clients *continuing* to want to stop or sharply reduce use. Factors that might sustain motivation to maintain behavior change include fears about consequences such as death or serious bodily harm, personal pride, wishes of family members or close friends, and the desire to avoid legal problems or loss of professional role/license. Hope for a better life can also sustain motivation, including the belief that one will be happier and more fulfilled when abstinent, will have better employment opportunities, and will be more likely to be a “success” in adult roles. In summary, motivation can be sustained to the degree that an individual continues to believe that staying abstinent will be worth the struggle it entails.

Unfortunately, many individuals with SUD do not have an abundance of natural reinforcers for sustained recovery. For many, lack of education and job skills makes prospects grim for meaningful employment that pays a decent wage (23). Years of active addiction may have led to an erosion of healthy social relationships and decline in activities that give life meaning and provide a sense of purpose. In the absence of strong incentives for sustained behavior change, even the most effective medication or behavioral treatment is unlikely to be effective for very long.

For example, consider the importance of employment. In addition to financial rewards, employment can provide many incentives for sustained recovery, including purpose and meaning, social support, structure and accountability, and a sense of accomplishment and

pride. A recent systematic review concluded that problematic substance use has a substantial negative impact on employment, and that unemployment following treatment substantially increases the risk of relapse (23). Unpublished data from one of our recent continuing care studies (24) indicate how serious unemployment problems are in this population. Mean number of days employed in the prior 30 days was 4.3 (sd= 7.9) at the 3 month follow-up, rising to 7.4 (sd=10.1) at 24 months. At 24 months, almost 6 out of ten participants (57%) in the sample had no days of paid employment in the prior month. Although relapse certainly cannot be entirely attributed to lack of work, chronic unemployment with few prospects is likely to erode motivation for recovery over time.

Most treatments for SUD generally devote little time to increasing rewarding and enriching activities in recovery. For example, CBT is focused on teaching people skills to cope with various stressors without using alcohol or drugs, and MI strives to reduce ambivalence about stopping or reducing use. Moreover, the medications that are available to treat alcoholism are designed to reduce the pleasure of drinking (i.e., naltrexone, nalmefene, acamprosate) or to make the alcoholic sick if he drinks (i.e., disulfiram). Granted, behavioral interventions also try to provide something positive, namely the benefits associated with an abstinent lifestyle. However, the emphasis is clearly on taking away something that has been of considerable importance to the individual.

This model appears to work quite well when people are in a crisis, and in those for whom the costs associated with continued alcohol or drug use are overwhelmingly high (e.g., pilots, physicians) (25). It also works well for people who for whatever combinations of reasons are stably committed to an abstinent lifestyle. However, for many with SUD, enthusiasm for most current treatments is likely to wane after a few months, when the negative consequences of the crisis that drove the person into treatment have subsided somewhat. Roth-man (26) observed that fear of negative consequences may help someone stop smoking or using alcohol and drugs, but enjoyment of the benefits that these behavior changes bring are probably necessary to sustain changes in health behaviors. This simple statement says a great deal about why sustained recovery is difficult to achieve.

Therefore, in this piece, I am making two recommendations, largely derived from work on incentives and behavioral economics, on how to improve long-term outcomes for those with SUD. First, to achieve higher rates of sustained recovery, treatments are needed that go beyond a focus on reducing or eliminating substance use and in addition target greater access to experiences that will be enjoyable or otherwise rewarding to clients. Second, there must be sufficient incentives in the environment to make the effort needed to sustain long-term abstinence worth it. Findings from neuroscience, which demonstrate how addiction “highjacks” the reward centers of the brain (27,28), make an even stronger case for the importance of increased incentives for abstinence. Extended substance use decreases the impact of natural reinforcers in the environment and impairs judgment and other executive functions (27,29), which leads to delay discounting (30,31). Therefore, incentives for sustained behavior change probably need to be much stronger for those who have had substance use disorders than for other people, who have more intact reward centers.

How Can SUD Treatment Make Recovery More Rewarding?

Striving to make SUD treatment and abstinence more appealing is certainly not a new idea —it dates back to at least the early 1970s. The Community Reinforcement Approach (CRA) was designed to make abstinence more rewarding than continued use (32). CRA consists of CBT-based intervention components, counseling focused on developing new recreational activities and healthy social networks, employment counseling and assistance with practical needs such as housing, couples counseling for those in romantic relationships (33), and monitored disulfiram for those with alcohol problems. Some versions have also included a social club, where sober parties and other activities were held on weekends, and contingency management to reinforce drug abstinence. CRA is considered an evidence-based treatment for alcohol and cocaine dependence (33,34)

Higgins and colleagues conducted an intriguing study that highlighted the broad benefits of the CRA approach (34). In this study, treatment seeking cocaine dependent individuals were randomly assigned to CM only (vouchers contingent on cocaine abstinence) or to a version of CRA that included vouchers contingent on cocaine abstinence but no social club. Clients in the CRA+CM condition had better retention in treatment, used less cocaine during treatment, and reported less drinking to intoxication during treatment and follow-up, compared to those receiving CM only. Those in CRA+CM also reported more days of employment during treatment and for the first six months of the follow-up, lower levels of depression during treatment, and fewer hospitalizations and legal problems during follow-up. CRA apparently did in fact have some success in making abstinence more rewarding than continued use, as evidenced by sustained improvements on a wide range of outcomes.

What do we know about what makes CRA effective? The only real unpacking of CRA has been to examine the relative impact of vouchers vs. the rest of the package (34). However, other research has strongly supported the efficacy of specific CRA components, when they have been studies as separate interventions. There is good evidence that behavioral couples therapy improves both alcohol use outcomes and marital satisfaction, at least in alcohol dependent clients (14,35,36). Several interventions have been developed to increase participation in AA and other pro-recovery social activities, and they have increased participation in such activities and improved substance use outcomes (37,38).

As noted earlier, employment problems are common in individuals with SUD, and have consistently been associated with worse outcomes. Unemployment is very difficult to address, given the skills and experiences deficits often found in this population, and relatively high rates of convictions for criminal offenses. There have been several creative attempts to increase employment in those with SUDs. For example, Silverman and colleagues have developed and evaluated therapeutic workplaces, in which access to work is contingent on drug free urine samples and incentives are used to reward productivity and accuracy (39–41).

However, there has been little work to understand or improve the other CRA components that are focused on making abstinence more rewarding, such as the development of new hobbies, recreational activities, and other involvements that bring a sense of meaning,

purpose, and even excitement to one's life. Granted, this is difficult and slow work, and may seem more appropriate for social work, vocational training, or long-term psychotherapy. And in many people, the work may really have to focus on identifying and nurturing such activities, rather than on re-discovering them, especially in clients whose addiction began early enough to derail the establishment of other interests and skills.

Despite the inherent difficulties in inculcating interests, passions, and commitments in clients with SUD, I believe that treatment interventions—particularly as part of continuing care—need to stress to a much greater degree ways to increase these factors in recovery. This is a fundamentally different approach than addressing co-occurring problems that contribute to bad outcomes such as depression or poor executive function. Rather, this is about figuring out how to increase positive, reinforcing activities and experiences in daily life—the activities that bring pleasure, enjoyment, engagement, excitement, hope for improvement, and sense of belonging and purpose. If clients felt that their treatment sessions were more directly focused on these issues and they experienced a clear increase in the frequency of enjoyable or otherwise reinforcing activities in their daily lives, I assert that they would be more likely to remain in treatment and to reduce their use of alcohol and drugs. This may be a more direct way to deal with a hijacked reward system than memory training and other interventions designed to strengthen the frontal cortex to deal with impulsivity and delay discounting (30,42).

There have been at least two behavioral economics studies that evaluated interventions specifically designed to increase substance-free or pleasant activities (43,44), and both yielded positive effects on substance use outcomes. In addition, behavioral activation, a treatment developed for depression that is focused on increasing participation in enjoyable activities, has shown initial promise in the treatment of substance use disorders (45,46). More research is needed to develop and evaluate new intervention components that focus on increasing positive, reinforcing activities in daily life, or to identifying interventions that have been successfully used in other fields and could be adapted for SUD clients. This would require a combination of more basic laboratory research to try out ideas under carefully controlled conditions and establish proof of concept, as well as subsequent randomized trials with treatment populations to determine if the interventions do increase daily reinforcing activities—and lead to better SUD outcomes. A greater focus on assessment of strengths, supports, interests, and life goals at intake and during the course of treatment (47) would facilitate enhanced efforts to build individualized incentives and rewarding experiences into the treatment plan and increase recovery capital, which refers to the personal, family/social, and community resources that the client is able to access and make use of to support sustained recovery (48,49).

Increasing Incentives for Recovery at the Community and National Level

Long-term SUD treatment outcomes may be improved by focusing treatment to a greater extent on helping clients to identify and involve themselves in activities that are rewarding and enjoyable. However, more attention is also needed on how to increase the availability of such reinforcers in the environments in which the clients live. This, of course, is much more complicated, as it involves making changes in the community and even at the national level.

Community

In their studies of the Therapeutic Workplace, Silverman and colleagues found that participants had a difficult time maintaining abstinence and transitioning to other employment situations (39,40). To promote sustained employment and recovery, Silverman, Holtyn, and Morrison (41) have proposed three employment models for individuals attempting long-term recovery from SUD. The first involves the use of social businesses, such as their Therapeutic Workplace, which operate outside the profit-seeking economy and have been used to provide employment opportunities to people with mental illness. In the second model, referred to as the Cooperative Employer, businesses hire individuals in recovery from SUD for the good of their communities or other social welfare motivated reasons, and require that these individuals maintain abstinence as indicated by random drug testing and other types of monitoring. Businesses may also hire individuals in recovery or provide support to this group in other ways because reducing substance use in the community is good for business.

Other community-level interventions may also promote long-term recovery. White (50) has outlined a number of initiatives communities can employ to improve recovery rates, including the extension of treatment and recovery support services into the community, greater collaboration between treatment and peer organizations, and recovery community building. “Housing first” initiatives for those with substance use disorders appear to reduce homelessness rates and may improve substance use outcomes (51). Communities can also work to reduce triggers for relapse, by limiting how many hours per day bars and restaurants can serve liquor, and reducing the density of liquor stores. Improving the location and physical appearance of substance use disorder treatment facilities may reduce stigma and increase interest in getting help. It can be quite an eye-opener to contrast the appearance of buildings devoted to other medical disciplines (e.g., cardiac care, cancer treatment) to those that house addiction treatment programs.

Finally, community based mutual support programs, such as Alcoholics Anonymous, can provide some of the incentives that make sustained recovery more appealing (52). These include greater self acceptance and hope for a better life, and entre into a network of people who offer support to each other in a variety of ways, that can include friendships, romantic relationships, recreational activities, and help with issues such as employment and housing. Moreover, mutual help programs give participants the opportunity to help others, which can be highly rewarding. However, as has been widely noted, most individuals with substance use disorders do not engage in mutual help programs, which highlights the need for a variety of recovery incentives in the community.

National policies and priorities

Although much of the work to increase incentives for recovery must be done at the local level, there is a role—and I will argue an obligation—for national policies in this regard. As a society, we place some value on the rehabilitation of individuals who have stumbled, or fallen badly, on the pathway toward productive and engaged citizenship. There are examples of redemption in which individuals seem to have done it “on their own.” However, in most cases there has been some combination of family members or friends, mutual help programs,

treatment interventions, socially-conscious employers, and national polices that have helped to facilitate recovery. We want to see people succeed, and we are usually willing to offer second chances and opportunities for advancement to those who want to take advantage of them.

In that regard, the third employment model proposed by Silverman et al. (41) makes use of wage supplements to increase rates of sustained employment and recovery. The supplements are contingent on maintaining abstinence and competitive employment in a community job. Silverman et al. (41) note that such programs have been successfully used in the US and Canada to increase employment in welfare recipients. Broad implementation of such a program requires the infrastructure to conduct random urine tests, as well as the funds to support the supplements. Silverman et al. (41) propose that the massive urine drug testing system run by the U.S. Department of Transportation could be used in a large-scale wage supplement program. With regard to funding of supplements, Silverman et al. (41) note that the success of this approach "will depend on creative, bold and compassionate public and private partnerships."

It is worth noting that national policies and priorities have played major roles in addressing other behavior-related disorders, including obesity and HIV/AIDs. For example, there has been considerable work on the broad structural and policy factors that influence transmission of HIV/AIDs and the onset and maintenance of obesity. For those with severe substance use disorders, opportunities for advancement are often limited by poor educational experiences and convictions for drug-related offenses. National policies that better addressed these barriers could do much to improve long-term treatment outcomes by opening pathways to access incentives that are already available to those with better educations and no criminal convictions.

Caveats and Final Thoughts

It is important to stress that I am not suggesting that further work to improve treatments through neuroscience, pharmacogenetics, and the study of mechanisms of change should be limited or curtailed. These efforts are likely to continue to improve treatment outcomes, if incrementally. Moreover, my arguments apply primarily to individuals with more severe substance use disorders who have not been able to achieve long-term recovery on their own, or via self/mutual help or formal treatment. This is admittedly a rather small percentage of those with hazardous substance use or substance use disorders. And there are many individuals who have struggled with substance use disorders who find plenty of incentives to motivate sustained recoveries, and they clearly do not need further help in this regard. My remarks also are focused on what is needed to increase rates of long-term recovery, rather than on improving short-term outcomes, which are often quite good. The arguments here apply to opiate dependence, but it seems clear that long-term agonist treatment is also needed to achieve sustained recovery.

Implementing the recommendations offered here would be challenging, and require more active commitment and participation at the community and national levels as well as increased economic support. Moreover, additional work is needed to develop more powerful

and creative approaches to making recovery more appealing, and to determine how best to implement these strategies. However, given the pain, damage, wasted lives, and enormous costs associated with substance use disorders, these investments are likely to result in major improvements in quality of life for those with these disorders and others in the communities in which they live.

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References

1. Bickel WK, Marsch LA, Buchhalter AR, Badger GJ. Computerized behavior therapy for opioid-dependent outpatients: A randomized controlled trial. Exp Clin Psychopharmacol. 2008; 16(2):132–143. [PubMed: 18489017]
2. Campbell ANC, Nunes EV, Matthews AG, Stitzer M, Miele GM, Polsky D, et al. Inter-net-delivered treatment for substance abuse: A multisite randomized controlled trial. American Journal of Psychiatry. 2014; 171:683–690. [PubMed: 24700332]
3. Carroll KM, Ball SA, Martino S, Nich C, Babuscio TA, Nuro KF, et al. Computer-assisted delivery of cognitive-behavioral therapy for addiction: A randomized trial of CBT4CBT. American Journal of Psychiatry. 2008; 165:881–888. [PubMed: 18450927]
4. Carroll KM, Kiluk BD, Nich C, Gordon MA, Portnoy GA, Marino DR, et al. Computer-assisted delivery of cognitive-behavioral therapy: Efficacy and durability of CBT4CBT among cocaine-dependent individuals maintained on methadone. American Journal of Psychiatry. 2014; 171:436–444. [PubMed: 24577287]
5. Marsche LA, Guarino H, Acosta M, Aponte-Melendez Y, Cleland C, Grabinski M, et al. Web-based behavioral treatment for substance use disorders as a partial replacement of standard methadone maintenance treatment. Journal of Substance Abuse Treatment. 2014; 46:43–51. [PubMed: 24060350]
6. Gustafson DH, McTavish FM, Chih M-Y, Atwood AK, Johnson RA, Boyle MG, et al. A smartphone application to support recovery from alcoholism: A randomized controlled trial. JAMA Archives of General Psychiatry. 2014; 71:566–572.
7. Magill M, Gaume J, Apodaca TR, Walthers J, Mastroleo NR, Borsari B, et al. The technical hypothesis of motivational interviewing: A meta-analysis of MI's causal model. Journal of Consulting and Clinical Psychology. 2014; 82:973–983. [PubMed: 24841862]
8. Koob GF, Volkow ND. Neurocircuitry of addiction. Neuropsychopharmacy Reviews. 2010; 35:217–238.
9. Volkow ND, Koob GF, McLellan AT. Neurobiologic advances from the brain disease model of addiction. New England Journal of Medicine. 2016; 374:363–371. [PubMed: 26816013]
10. Burke RL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. Journal of Consulting and Clinical Psychology. 2003; 71:843–861. [PubMed: 14516234]
11. Davis ML, Powers MB, Handelsman P, Medina JL, Zvolensky M, Smits JA. Behavioral therapies for treatment-seeking cannabis users: a meta-analysis of randomized controlled trials. Eval Health Prof. 2015; 38(1):94–114. Epub 2014 Apr 2. Also available: http://dx.doi.org/10.1177/0163278714529970. [PubMed: 24695072]
12. Dutra L, Stathopoulou G, Basden S, Leyro TM, Powers MB, Otto MW. A meta-analytic review of psychosocial interventions for substance use disorders. American Journal of Psychiatry. 2008; 65:179–187.

13. Magill M, Ray LA. Cognitive-behavioral treatment with adult alcohol and illicit drug users: A meta-analysis of randomized controlled trials. J Stud Alcohol Drugs. 2009; 70(4):516–527. [PubMed: 19515291]
14. Morgenstern J, McKay JR. Rethinking the paradigms that inform behavioral treatment research for substance use disorders. Addiction. 2007; 102:1377–1389. [PubMed: 17610541]
15. Harris AHS, Oliva E, Bowe T, Humphreys KN, Kivlahan DR, Trafton JA. Pharma-cotherapy of alcohol use disorders by the Veterans Health Administration: Patterns of receipt and persistence. Psychiatric Services. 2012; 63:679–685. [PubMed: 22549276]
16. Jonas DE, Amick HR, Feltner C, Bobashev G, Thomas K, Wines R, et al. Pharmacother-apy for adults with alcohol-use disorders in outpatient settings: A systematic review and meta-analysis. JAMA. 2014; 311:1889–1900. [PubMed: 24825644]
17. Blodgett JC, Maisel NC, Fuh IL, Wilbourne PL, Finney JW. How effective is continuing care for substance use disorders? A meta-analytic review. Journal of Substance Abuse Treatment. 2014; 46:87–97. [PubMed: 24075796]
18. Dennis ML, Scott CK. Managing addiction as a chronic condition. Addiction Science and Clinical Practice. 2007 Dec.:45–55. [PubMed: 18292710]
19. Dennis ML, Scott CK, Funk R, Foss MA. The duration and correlates of addiction and treatment careers. Journal of Substance Abuse Treatment. 2005; 28:S51–62. [PubMed: 15797639]
20. Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014. NSDUH Series H-48, HHS Publication No. (SMA) 14–4863
21. Mattick RP, Breen C, Kimber J, Davoli M. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. Cochrane Database of Systematic Reviews. 2009; 3 Art. No.: CD002209. doi: 10.1002/14651858.CD002209.pub2
22. Prendertgast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for the treatment of substance use disorders: A meta analysis. Addiction. 2006; 10:1546–1560.
23. Henkel D. Unemployment and substance use: A review of the literature (1990–2010). Current Drug Abuse Reviews. 2011; 4:4–27. [PubMed: 21466502]
24. McKay JR, Van Horn DHA, Lynch KG, Ivey M, Cary MS, Drapkin M, et al. An adaptive approach for identifying cocaine dependent patients who benefit from extended continuing care. Journal of Consulting and Clinical Psychology. 2013; 81:1063–1073. [PubMed: 24041231]
25. McLellan AT, Skipper GS, Campbell M, DuPont RL. Five-year outcomes in a cohort study of physicians treated for substance use disorders in the United States. British Medical Journal. 2008; 337:2038.
26. Rothman AJ. Toward a theory-based analysis of behavioral maintenance. Health Psychology. 2000; 19(Suppl):64–69. [PubMed: 10709949]
27. Kalivas PW. Neurobiology of cocaine addiction: Implications for new pharma-cotherapy. American Journal on Addictions. 2007; 16:71–78. [PubMed: 17453607]
28. Koob GF, Volkow ND. Neurocircuitry of addiction. Neuropsychopharmacology Reviews. 2010; 35:217–238. [PubMed: 19710631]
29. Koob GF. The neurobiology of addiction: A neuroadaptational view relevant for diagnosis. Addiction. 2006; 101(Suppl 1):23–30. [PubMed: 16930158]
30. Bickel WK, Quisenberry AJ, Moody L, Wilson AG. Therapeutic opportunities for self-control repair in addiction and related disorders: Change and the limits of change in trans-disease processes. Clinical Psychological Services. 2015; 3:140–153.
31. Tucker JA, Vuchinich RE, Rippens PD. Predicting natural resolution of alcohol-related problems: A prospective behavioral economic analysis. Experimental and Clinical Psychopharmacology. 2002; 10:248–257. [PubMed: 12233985]
32. Hunt GM, Azrin NH. A community-reinforcement approach to alcoholism. Behavior Research and Therapy. 1973; 11:91–104.
33. Meyers RJ, Roozen HG, Smith JE. The Community Reinforcement Approach: An update of the evidence. Alcohol Research and Health. 2011; 33:380–388. [PubMed: 23580022]

34. Higgins ST, Sigmon SC, Wong CJ, Heil SH, Badger GJ, Donham R, et al. Community reinforcement therapy for cocaine-dependent outpatients. Archives of General Psychiatry. 2003; 60:1043–1052. [PubMed: 14557150]
35. O'Farrell TJ, Cutter HS, Choquette KA, Floyd FJ, Bayog RD. Behavioral marital therapy for male alcoholics: Marital and drinking adjustment during the two years after treatment. Behav Ther. 1992; 23:529–49.
36. O'Farrell TJ, Choquette KA, Cutter HS. Couples relapse prevention sessions after behavioral marital therapy for male alcoholics: Outcomes during the three years after starting treatment. J Stud Alcohol. 1998; 59:357–70. [PubMed: 9647418]
37. Litt MD, Kadden RM, Kabela-Cormier E, Petry N. Changing network support for drinking: Network support project two-year follow-up. Journal of Consulting and Clinical Psychology. 2009; 77(2):229–242. [PubMed: 19309183]
38. Timko C, DeBenedetti A, Billow R. Intensive referral to 12-step self-help groups and 6-month substance use disorder outcomes. Addiction. 2006; 101:678–688. [PubMed: 16669901]
39. Aklin WM, Wong CJ, Hampton J, Svikis DS, Stitzer ML, Bigelow GE, et al. A therapeutic workplace for the long-term treatment of drug addiction and unemployment: Eight-year outcomes of a social business intervention. Journal of Substance Abuse Treatment. 2014; 47:329–338. [PubMed: 25124257]
40. DeFulio A, Silverman K. Employment-based abstinence reinforcement as a maintenance intervention for the treatment of cocaine dependence: Post-intervention outcomes. Addiction. 2011; 106:960–967. [PubMed: 21226886]
41. Silverman K, Holtyn AG, Morrison R. The therapeutic utility of employment in treating drug addiction: Science to application. Translational Issues in Psychological Science. In press.
42. Bickel WK, Yi R, Landes RD, Hill PF, Baxter C. Remember the future: Working memory training decreases delay discounting among stimulant addicts. Biological Psychiatry. 2011; 69:260–265. [PubMed: 20965498]
43. Murphy JG, Dennhardt AA, Skidmore JR, Borsari B, Barnett NP, Colby SM, et al. A randomized controlled trial of a behavioral economic supplement to brief motivational interventions for college students. Journal of Consulting and Clinical Psychology. 2012; 80:876–886. [PubMed: 22663899]
44. Rogers RE, Higgins ST, Silverman K, Thomas CS, Badger GJ, Bigelow G, et al. Abstinence-contingent reinforcement and engagement in non-drug-related activities among illicit drug abusers. Psychology of Addictive Behavior. 2008; 22:544–550.
45. Daughters SB, Braun AR, Sargeant MN, Reynolds EK, Hopko DR, Blanco C, Lejuez CW. Effectiveness of a brief behavioral treatment for inner-city illicit drug users with elevated depressive symptoms: The Life Enhancement Treatment for Substance Use (LETS Act!). Journal of Clinical Psychiatry. 2008; 69:122–129. [PubMed: 18312046]
46. Magidson JF, Gorka SM, MacPherson L, Hopko DR, Blanco C, Lejuez CW, Daughters SB. Examining the effect of the Life Enhancement Treatment for Substance Use (LETS ACT) on residential substance abuse treatment retention. Addictive Behaviors. 2011; 36:615–623. [PubMed: 21310539]
47. Marsden J, Eastwood B, Ali R, Burkinshaw P, Chohan G, Copello A, et al. Development of the Addiction Dimensions for Assessment and Personalized Treatment (ADAPT). Addiction. 2014; 139:121–131.
48. Laudet AB, White WL. Recovery capital as prospective predictor of sustained recovery, life satisfaction, and stress among former poly-substance users. Substance Use and Misuse. 2008; 43:27–54. [PubMed: 18189204]
49. White WL, Cloud W. Recovery capital: A primer for addiction professionals. Counselor. 2008; 9:22–27.
50. White WL. The mobilization of community resources to support long-term addiction recovery. Journal of Substance Abuse Treatment. 2009; 36:146–158. [PubMed: 19161895]
51. Kertesz SG, Crouch K, Milby JB, Cusimano RE, Schumacher JE. Housing first for homeless persons with active addiction: Are we overreaching? Milbank Quarterly. 2009; 87:495–534. [PubMed: 19523126]

52. Humphreys K, Wing S, McCarty D, Chappel J, Gallant L, Haberle B, Horvath AT, Kaskutas LA, Kirk T, Kivlahan D, Laudet A, McCrady BS, McLellan AT, Morgenstern J, Townsend M, Weiss R. Self-help organizations for alcohol and drug problems: Toward evidence-based practice and policy. Journal of Substance Abuse Treatment. 2004; 26:151–158. [PubMed: 15063905]