A Therapeutic Workplace to Address Poverty and Substance Use

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1. Abstract

Alcohol addiction is a chronic relapsing disorder. High magnitude and long-duration voucher-based abstinence reinforcement is one of the most effective treatments for alcohol and drug addiction and can maintain abstinence over extended periods of time, but practical methods of implementing these interventions are needed. Workplaces could be ideal and practical vehicles for arranging and maintaining abstinence reinforcement over long time periods. Our research on a model Therapeutic Workplace has shown that employment-based abstinence reinforcement, in which participants must provide alcohol- or drug-free urine samples to maintain maximum pay, can maintain alcohol and drug abstinence. Now we need to develop effective and economically sound methods to arrange long-term exposure to employment-based abstinence reinforcement. We are proposing to evaluate the effectiveness and economic benefits of a Wage Supplement Model of arranging long-term exposure to employment-based abstinence reinforcement. Under this model, successful Therapeutic Workplace participants are offered abstinence-contingent wage supplements if they obtain and maintain competitive employment. Governments have used wage supplements effectively to increase employment in welfare recipients. The Wage Supplement Model harnesses the power of wage supplements to promote employment, while simultaneously using the wage supplements to reinforce alcohol abstinence. The intervention will combine 3 elements -- the Therapeutic Workplace, Individual Placement and Support (IPS) supported employment, and abstinence-contingent wage supplements. IPS is a supported employment intervention that has been proven effective in promoting employment in adults with severe mental illness. Under this model, participants will be exposed to the Therapeutic Workplace to initiate alcohol abstinence and establish job skills. To promote employment and prevent relapse to alcohol use, participants will receive IPS Plus Abstinence-Contingent Wage Supplements. A randomized trial will evaluate the effectiveness and economic benefits of the Abstinence-Contingent Wage Supplement Model in promoting employment and sustaining alcohol abstinence in homeless adults with alcohol use disorder (N=130). Participants will be enrolled in the Therapeutic Workplace for 1 month and then randomly assigned to a Usual Care Control group or an IPS Plus Abstinence-Contingent Wage Supplement group for 6 months. Usual Care Control participants will be offered counseling and referrals to employment and treatment programs. IPS Plus Abstinence-Contingent Wage Supplement participants will receive the IPS intervention and abstinence-contingent wage supplements. Throughout the study, a wearable alcohol biosensor will be used to continuously monitor alcohol use. This novel intervention could be an effective and economically sound way to promote long-term employment and alcohol abstinence in homeless adults with alcohol use disorder, a population at risk for many adverse outcomes because of their poverty, unemployment, homelessness and alcohol use.

2. Objectives

The project will have the following Specific Aims:

Primary Aim

- *Biologically-Verified Alcohol Abstinence. Assess the effectiveness of IPS Plus Abstinence-Contingent Wage Supplements in promoting biologically-verified alcohol abstinence during the intervention.*

Secondary Aims

- *Self-Reported Alcohol Use. Assess the effectiveness of IPS Plus Abstinence-Contingent Wage Supplements in reducing self-reported alcohol use during the intervention.*
- *Employment. Assess the effectiveness of IPS Plus Abstinence-Contingent Wage Supplements in promoting employment during the intervention*.
- *Post-Intervention Effects. Assess the effectiveness of IPS Plus Abstinence-Contingent Wage Supplements in promoting alcohol abstinence and employment after the intervention ends*.
- *Economic Analyses. Assess the costs, cost-effectiveness, and cost-benefit of IPS Plus Abstinence-Contingent Wage Supplements.*

3. Background

Alcohol and drug addiction are often chronic problems that persist for many years and sometimes throughout a person's lifetime (Dennis & Scott, 2007; McLellan et al., 2000; Moos & Moos, 2007; Vaillant, 1996, 2003). Treatments can promote abstinence in some patients, but relapse is common after treatment (Etter & Stapleton, 2006; Knapp et al., 2007; Lancaster et al., 2006; Sees et al., 2000; Tonstad et al., 2006; Veilleux et al., 2010). Many individuals achieve periods of abstinence that last a year or more, but still relapse (Galai et al., 2003; Shah, Galai et al., 2006; Vaillant, 1996, 2003). Developing enduring solutions to sustain abstinence over many years is perhaps the greatest challenge facing the alcohol treatment research community. This project seeks to develop a long-term treatment to address the chronic relapsing nature of alcohol addiction.

Treating Homeless Adults with Alcohol Use Disorder

This project will focus on homeless adults with alcohol use disorder. Few populations are beset with the constellation of problems that afflict homeless individuals (Fischer & Breakey, 1991b). At the heart of much of this misfortune are staggering rates of alcoholism (Breakey et al., 1989; Fazel et al., 2008; Fischer & Breakey, 1991b; Toro et al., 1995). Estimates show that as much as half of homeless adults have current alcohol use disorders (Fazel et al., 2008). Treatment of alcohol use disorder in the homeless is complicated by the range of problems they face (Fischer & Breakey, 1991a; Toro et al., 1995) including "extreme poverty; underutilization of public entitlements; isolation from family, friends, and other support networks; frequent contact with correctional agencies; and poor general health (Fischer & Breakey, 1991a)." The Institute of Medicine identified the homeless as a group in need of specialized interventions that are tailored to their unique characteristics and needs (IOM 1990), including housing, income and employment (Zerger, 2002).

Studies have experimentally evaluated interventions for homeless adults who used drugs and/or alcohol, but few studies have focused exclusively on homeless adults with alcohol use disorder. Early projects supported by NIAAA and NIDA demonstrated both the challenge and potential of treating substance abusing homeless individuals. A few treatments were found to be effective (Lam et al., 1995; Milby et al., 1996; Sosin et al., 1995), but most controlled studies failed to show clear effects of experimental treatments relative to control conditions (Lapham et al., 1995; Smith et al., 1995; Stahler, 1995; Wright & Devine, 1995), and both dropout and relapse to substance use were common (Orwin et al., 1999; Zerger, 2002). More recent interventions for homeless, substance-dependent adults have had mixed effects (Fitzpatrick-Lewis et al., 2011; Hwang et al., 2005; de Vet et al., 2013). One recent and well-controlled study investigated intensive and long-term Chronic Care Management that combined motivational enhancement therapy, relapse prevention counseling, and onsite medical, addiction, and psychiatric services. This intensive approach did not affect drug and alcohol use in a general population of drug and alcohol users, in the subset of alcohol users, or in a subset of homeless adults (Saitz et al., 2013). Housing first interventions that provide housing to homeless adults with alcohol use disorder can be cost effective, however, their effects are directly related to the duration of the housing provided and the effects of housing on alcohol use have not been experimentally demonstrated (Larimer et al., 2009). Overall, although some treatments have shown promise, the experimental results have been mixed and it is unclear which treatments are effective and best suited to the needs of this population.

Behavioral Economic Incentives in the Treatment of Homeless Adults with Alcohol Use Disorder

Behavioral economic incentive treatments for drug and alcohol dependence have a strong theoretical and empirical foundation and have produced some of the most promising effects in homeless adults.

Theoretical and empirical underpinnings. Behavioral economic incentive interventions are rooted in research that suggests that alcohol addiction is operant behavior that is maintained and modifiable by its

consequences (Bigelow & Silverman, 1999). Consequences that increase behavior are called reinforcers, commonly referred to as incentives. Operant research shows that the value of incentives decreases as the delay to the incentive increases (Bickel et al. 2014). Benefits of health behaviors like alcohol abstinence are delayed, which may explain why alcohol abstinence does not always maintain without special interventions. Behavioral economic incentive interventions are designed to bridge the gap between health behaviors and their delayed health benefits. They provide immediate incentives for health behaviors to increase their frequency. Seminal studies by Bigelow (Co-investigator) showed that alcohol use in "chronic alcoholics" could be reduced by providing incentives contingent on alcohol abstinence (Bigelow et al., 1975; Bigelow and Liebson, 1972).

Application of behavioral principles to the treatment of homeless adults. Miller offered incentives to alcohol-dependent adults contingent on the provision of alcohol-free breath samples (Miller et al., 1974), including in a study with "skid row alcoholics" (Miller, 1975). Milby showed that an intervention that provided abstinence-contingent housing and work therapy could promote abstinence in homeless, cocaine-dependent adults (Milby et al., 1996, 2000, 2010). A behavioral treatment that applied the Community Reinforcement Approach, incentives for attendance, and housing contingent on alcohol-free breath samples was effective in promoting alcohol abstinence in homeless adults (Smith et al., 1998). A study by Silverman (Co-PI) and his colleagues showed that access to paid employment in a model "therapeutic workplace" contingent on alcohol-free breath samples increased alcohol abstinence relative to a condition in which access to paid employment was offered independent of breath-alcohol results (Koffarnus et al., 2011). These studies show that behavioral treatments can be effective in homeless adults. However, like other treatments, behavioral treatments have not reliably produced long-term abstinence, employment or housing that persists after the intervention ends.

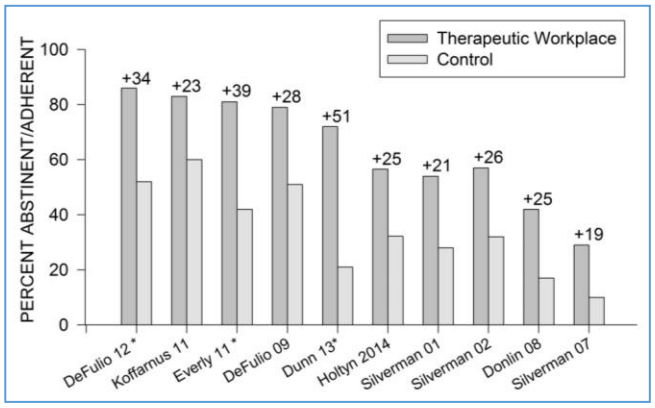
A Therapeutic Workplace to Address the Chronic Nature of Drug Addiction

We propose to develop a novel incentive-based treatment for homeless adults with alcohol use disorders designed to promote long-term employment and abstinence from alcohol. Interventions in which patients receive incentives contingent on providing objective evidence of alcohol or drug abstinence may be the most effective psychosocial addiction treatments (Castells et al., 2009; Dutra et al., 2008; Knapp et al., 2007; Pilling et al., 2007). One of the most effective incentive interventions is voucher reinforcement in which patients receive monetary vouchers for providing drug-free urine samples (Higgins et al., 1991). Voucher reinforcement can increase abstinence from alcohol and a wide range of drugs (Lussier et al., 2006). The Co-PI (Silverman) and others (Castells et al., 2009) have shown that voucher reinforcement can increase drug abstinence in injection drug users (Silverman et al., 1996a, 1998); and that high value vouchers can initiate abstinence in refractory drug users (Dallery et al., 2001; Silverman et al., 1999). As with other treatments, many patients relapse to alcohol or drug use after abstinence incentives are discontinued. To address this, Silverman (Co-PI) and colleagues have used abstinence reinforcement as a maintenance intervention and showed that sustained voucher reinforcement could maintain drug abstinence for a year (Silverman et al., 2004).

The Therapeutic Workplace. The need for high magnitude and long duration abstinence reinforcement raises an obvious practical problem: How can high magnitude and long duration reinforcement be financed? Silverman and his colleagues developed the Therapeutic Workplace to address this problem. The essential features of the intervention are simple: Participants are hired and paid to work, as in typical employment. To promote abstinence, participants must provide objective evidence of drug and/or alcohol abstinence to maintain access to the workplace and maximum pay. The approach does not require an independent source of funds to address abstinence, but instead harnesses the reinforcing effects of wages to reinforce abstinence. Since employment can be sustained for years, this approach offers the potential advantage of maintaining high magnitude employment-based abstinence reinforcement over long periods of time.

Phases of treatment. The Therapeutic Workplace was originally designed to treat low-income, unemployed drug-dependent women. Since many women lacked job skills (Silverman et al., 1995), we designed two phases of treatment. During Phase 1, each patient's "job" was to participate in a stipend-supported training program designed to establish job skills and initiate abstinence. Once participants initiated abstinence and acquired skills, they progressed to Phase 2 and were hired as data entry operators (Silverman et al., 2005). Employment-based abstinence reinforcement is maintained throughout both phases.

Therapeutic Workplace research. Our initial study showed that the Therapeutic Workplace could initiate (Silverman et al., 2001) and maintain drug abstinence for 4 years (Aklin et al., 2014; Silverman et al., 2002) in pregnant/postpartum methadone patients. Other studies showed that employment-based abstinence reinforcement could promote drug abstinence in injection drug users (Holtyn et al., 2014; Silverman et al., 2007), and could promote adherence to naltrexone in opioid-dependent adults (DeFulio et al., 2012; Dunn et al., 2013; Everly et al., 2011). Particularly relevant to this application, the Therapeutic Workplace has been shown effective in promoting alcohol abstinence in homeless alcohol-dependent adults (Koffarnus et al., 2011). The adjacent figure shows outcomes from 10 studies evaluating the Therapeutic Workplace on drug or alcohol abstinence and naltrexone adherence (asterisks). Values above the bars show the amount of increase produced by the Therapeutic Workplace; all were significant (See Silverman et al., 2012).



Scientific Premise: *A critical challenge*. Most controlled studies conducted with substance abusing homeless adults have failed to show clear effects of experimental treatments relative to control conditions. Our research shows that a year-long exposure to employment-based abstinence reinforcement effectively sustains drug abstinence throughout a year of employment (DeFulio et al., 2009), but many participants relapsed in the year after the employment-based abstinence reinforcement ended (DeFulio & Silverman, 2011). This suggests that we may need to maintain employment-based abstinence reinforcement over an extended time to prevent relapse in some patients. The proposed research seeks to develop cost-effective ways of arranging long-term employment-based reinforcement to support recovery.

Models to Arrange Long-Term Employment-Based Abstinence Reinforcement

We developed three models to maintain employment-based abstinence reinforcement (Silverman, Holtyn and Morrison, in press; Appendix). Under all models, individuals enroll in Phase 1 to initiate abstinence and establish skills. The models differ in how employment-based reinforcement is maintained.

The Social Business Model. Under the Social Business model, Phase 1 graduates are hired as employees in a social business. A social business, a concept that won Muhammad Yunus the Nobel Prize, exists to address the needs of low-income people (Weber & Yunus, 2010; Yunus & Weber, 2007). We established a Therapeutic Workplace Social Business, Hopkins Data Services, to maintain employment-based abstinence reinforcement. Our experience suggests that the Therapeutic Workplace Social Business can be feasible (Silverman et al., 2005) and effective (Aklin et al., 2014), but it may have limited capacity and is difficult to scale up relative to our other models.

The Cooperative Employer Model. Under the Cooperative Employer model, a community employer hires Phase 1 graduates and requires that they undergo drug testing and remain abstinent to maintain employment. This model is more scalable, but has limited capacity, since it requires cooperating employers.

The Wage Supplement Model. Under the Wage Supplement Model, graduates of Phase 1 are offered abstinence-contingent wage supplements if they maintain employment. Governments in Minnesota, Connecticut, Milwaukee, New York, and Canada have used wage supplements to increase employment in welfare recipients (Berlin, 2007; Michalopoulos, 2005; Riccio et al., 2010). This model harnesses the power of wage supplements to promote employment, while simultaneously using the wage supplements to reinforce alcohol abstinence. We have used abstinence-contingent wage supplements in occasional participants who obtain employment while participating in the Therapeutic Workplace (Silverman et al., 2002).

Development and Evaluation of the Abstinence-Contingent Wage Supplement Model

The Wage Supplement Model could expand employment opportunities and provide a financially viable means of arranging employment-based abstinence reinforcement as a long-term intervention. However, we must address three challenges of this model: 1) incorporate a method to increase employment; 2) evaluate the effectiveness of abstinence-contingent wage supplements in maintaining abstinence; and 3) assess the economic costs and benefits of abstinence-contingent wage supplements. Several innovative components of the proposed project designed to address these challenges are described here.

Individual Placement and Support (IPS). Increasing employment is critical to facilitate the success of the Therapeutic Workplace's Abstinence-Contingent Wage Supplement Model. Employment interventions for unemployed drug users have been ineffective (Magura et al., 2004; Svikis et al., 2012) and behavioral interventions for homeless cocaine-dependent (Kertesz et al., 2007) or alcohol-dependent (Smith et al., 1998) adults have failed to affect long-term employment outcomes. Therapeutic Workplace participants are employed at significantly higher rates after participation in the Therapeutic Workplace than before, but still only about 20% of participants work fulltime after Therapeutic Workplace participation (Sigurdsson et al., 2011). To increase employment, we will combine the Therapeutic Workplace with the IPS model of supported employment. IPS was designed to promote employment in persons with severe mental illness. Under IPS, employment specialists establish relationships with potential employers, and work with participants to identify available jobs, prepare applications, apply for positions, and support participants during employment. IPS has been shown effective in increasing employment in the U.S. and several other countries (Bond et al., 2012). IPS produced significant increases in employment in a subset of individuals with severe mental illness and a substance use disorder (Mueser et al., 2011) and in homeless adults with psychiatric or substance abuse problems (Rosenheck & Mares, 2007). We will adapt IPS to promote employment in participants after they initiate abstinence and acquire job skills in the Therapeutic Workplace.

Wage supplements to increase employment. Our research shows that participants, including homeless alcohol-dependent adults (Koffarnus et al., 2013), will not attend our training program or work consistently without incentives (Koffarnus et al., 2013; Koffarnus, DeFulio et al., 2013; Silverman, Chutuape et al., 1996; Wong et al., 2004a; Wong et al., 2004b). To increase motivation of participants to engage in IPS and obtain employment, participants will earn wage supplements for maintaining employment. Wage supplements can promote employment in welfare recipients (Berlin, 2007; Michalopoulos, 2005; Riccio et al., 2010). Given the failure of previous employment interventions for unemployed drug and alcohol users, combining IPS and wage supplements is warranted and could increase employment in this difficult population.

Abstinence contingency in provision of wage supplements to prevent relapse. Our research shows that employment alone is not sufficient to maintain abstinence. In the most relevant study (DeFulio et al., 2009), after completing Phase 1, participants who initiated cocaine abstinence were hired in our Phase 2 data entry business for one year and randomly assigned to two groups. Employment Only participants could work independent of their urinalysis results. Abstinence-Contingent Employment participants had to provide drug-free urine samples to work and maintain maximum pay. During Phase 2, Abstinence-Contingent Employment participants provided significantly more cocaine-negative samples than Employment Only participants (79.3% and 50.7%, respectively). Based on this study, we expect that many participants who become employed will relapse to alcohol use when employment-based abstinence reinforcement is discontinued. To sustain abstinence, participants who become employed will earn abstinence-contingent wage supplements as long as they continue to abstain from alcohol use. If a participant obtains employment, the participant will receive wage supplements ($8/hr for a maximum of 40 hours per week) for verified employment. The maximum amount in wage supplements will be available as long as the participant continues to abstain from alcohol use.

Utilization of a wearable alcohol biosensor. To facilitate dissemination of this intervention, we will use a wearable alcohol biosensor to monitor alcohol use. Wearable alcohol biosensors are devices that can be passively worn by individuals in their daily lives and can provide a continuous measure of alcohol use. NIAAA recently announced the winners of the *Wearable Alcohol Biosensor Challenge,* which was issued to stimulate public and private investment in development and refinement of these devices (www.challenge.gov/challenge/ a-wearable-alcohol-biosensor/). The proposed research will select the most appropriate biosensor from the available options. For example, the Secure Continuous Remote Alcohol Monitor (SCRAM) is an ankle bracelet that can be worn continuously, including in the shower, and includes features that allow for detection of removal and tampering. It provides an estimate of blood alcohol concentration by sampling alcohol vapor just above the skin, and also measures changes in skin temperature and skin reflectivity, which are used to detect device removal and tampering. These data are stored on the bracelet and transmitted wirelessly via a modem. Transmitted data are encrypted and stored in a web-based system called $SCRAM_{NET}$, which research staff can access to monitor alcohol use. BACtrack Skyn is a wrist bracelet that also provides an estimate of blood alcohol concentration by sampling alcohol vapor just above the skin. The bracelet can measure changes in skin temperature, which can be used to detect removal or tampering. Data are stored on the bracelet and can be transmitted

wirelessly via Bluetooth using a smartphone. Transmitted data are encrypted and stored in a web-based system provided by BACtrack, which research staff can access to monitor alcohol use. The proposed research will be the first to use a wearable alcohol biosensor to apply employment-based abstinence reinforcement as a therapeutic intervention.

The cost-effectiveness and cost-benefit of IPS plus abstinence-contingent wage supplements. We expect that costs of IPS plus abstinence-contingent wage supplements will be comparable to buprenorphine maintenance (Schackman et al., 2012) and less expensive than extended-release naltrexone (Kennedy et al., 2011). We will assess the costs, cost-effectiveness, and cost-benefits of IPS Plus Abstinence-Contingent Wage Supplements. Dunlap and Zarkin (Co-Is), experts in economic analyses, will conduct these analyses.

4. Study Procedures

a. Study design, including the sequence and timing of study procedures

Study Participants

Participants will be recruited from the Chemical Dependency Unit (CDU), an inpatient treatment program on the Johns Hopkins Bayview Campus that treats ~300 homeless adults with alcohol use disorder per year and the Johns Hopkins Bayview Medical Center (JHBMC) that treats ~180 homeless adults with alcohol use disorder per year. We may recruit from additional programs that serve homeless adults. We may recruit via internet-posted notices and newspaper advertisements using our study flyers and/or information sheets, and on social media platforms using our online advertisement scripts. We will use recruitment procedures that we used previously to successfully recruit homeless alcohol-dependent adults (Koffarnus et al., 2011).

Therapeutic Workplace and Job-Skills Training

To increase the chance that we engage participants, upon enrollment, participants will be invited to participate in a 1-week Therapeutic Workplace induction period. During the induction period, participants will be asked to maintain contact with Therapeutic Workplace staff by calling or texting staff every weekday. We have used similar induction procedures in our prior studies to successfully engage participants. Participants will be able to earn $20 per weekday for maintaining contact with our staff during the induction period. Participants who complete the 1-week induction will be given a wearable alcohol biosensor, invited to call in to the Therapeutic Workplace every weekday for 3 weeks, and can earn about $32/weekday for participating in our job-skills training program. Participants will be taught about the Therapeutic Workplace. Some or all of the training may be given through a computer-based training program. We may also evaluate the effectiveness of the training program by giving participants tests before and after they complete parts or all of the training program. We may re-administer the test at the end of the intervention to measure retention. Each Therapeutic Workplace participant will have a participant ID, which will be used to enter participant drug and alcohol testing results into our therapeutic workplace software, automatically implement any responses to drug and/or alcohol use based on testing results, and to automatically calculate participant daily pay based on compliance with drug and/or alcohol contingencies. Participants will be required to wear their wearable alcohol biosensor (SCRAM or BACtrack Skyn), which will record transdermal alcohol concentrations. Participants will be given separate care and use information about their wearable alcohol biosensor. Participants who wear a SCRAM bracelet will need to come to the Therapeutic Workplace (about every 30 days) so that the data stored on their bracelet can be transmitted to $SCRAM_{NET}$ and accessed by our research staff. Participants who wear a BACtrack Skyn bracelet will need to transmit the data stored on their bracelet via Bluetooth using a smartphone. At the end of Phase 1, participants will be randomly assigned to groups.

Experimental Design

Participants (N = 130) will be randomly assigned to a Usual Care Control or IPS Plus Abstinence-Contingent Wage Supplements group. Computerized urn randomization (Wei & Lachin, 1988) will balance groups on characteristics that may influence outcome: (1) percent of days abstinent from alcohol (assessed by transdermal alcohol concentrations prior to random assignment; ≥ rolling median, Y/N); (2) evidence of opiate and cocaine use from the assessment prior to random assignment (Y/N); (3) completed high school or obtained a GED (Y/N); and (4) gender (male/female). Participants will be stratified by alcohol and drug use because they should predict alcohol abstinence during the intervention period. High school completion or GED should be associated with employment. Participants will be stratified by gender to balance the two groups on a key biological factor that may influence outcome.

Individual Placement and Support (IPS) & Abstinence-Contingent Wage Supplement Group

This group will receive the full intervention being evaluated in this study for 6 months.

Individual Placement and Support (IPS). After Phase 1, participants will be offered the IPS model of supported employment for 6 months. IPS involves rapid job search, promotes competitive employment, and provides job supports and benefits counseling.

Abstinence-contingent wage supplements. Participants in this group will receive abstinence-contingent wage supplements. Before obtaining employment, participants will earn wage supplements for participating in IPS sessions and for completing tasks prescribed by IPS (e.g., developing a worker profile, applying for jobs, and completing interviews). The incentive system is designed to encourage participants to engage in about 4 hours of IPS each weekday and to allow participants to earn about $200 per week. We may offer bonus incentives to increase some job-seeking behaviors (e.g., completing job applications). We may also evaluate the effectiveness of those bonus incentives, for example, by applying and withdrawing them to see if those bonus incentives are needed to promote the job seeking behaviors. Once a participant becomes employed, participants will be able to earn up to $8 per hour for a maximum of 40 hours per week for working in a competitive job. To maintain long-term alcohol abstinence, participants will be required to wear their alcohol biosensor and to provide alcohol negative transdermal alcohol concentration readings to earn the maximum in wage supplements. $8 per hour was selected because that amount was effective in our prior research (Silverman et at., 2005).

Abstinence monitoring using SCRAM or BACtrack Skyn. Each participant will be paid for wearing a wearable alcohol biosensor (SCRAM or BACtrack Skyn). SCRAM will measure transdermal alcohol concentrations every 30 minutes. Infrared signals and temperature also will be recorded to ensure that no tampering or device removal occurs. Data recorded by SCRAM will be transferred wirelessly to a modem installed in our laboratory, which will transfer the data to a secure central server operated by the developers of SCRAM. These data can then be accessed via $SCRAM_{NET}$, a secure, web-based platform where all data are stored, including information on alcohol consumption, monitor obstructions or tampering, and the functioning of the battery and equipment. Participants may need to attend the Therapeutic Workplace (about every 30 days) so that data stored on their bracelet can be transmitted to $SCRAM_{NET}$ and accessed by our research staff. BACtrack Skyn can measure transdermal alcohol concentrations every second. Temperature will be recorded to capture potential tampering or device removal. Data recorded by BACtrack Skyn will be transferred wirelessly via Bluetooth to a secure portal operated by BACtrack. If participants do not have a smartphone that is capable of transmitting the data via Bluetooth, we may provide them with one to use during their study participation. Participants will need to remove their BACtrack Skyn bracelet to shower or bathe. Participants must receive permission to remove their bracelet by sending research staff a photo or video of themselves wearing the bracelet after they put it back on. Bracelet removal cannot exceed 60 minutes. To earn the maximum in wage supplements, participant's transdermal alcohol concentrations must not test positive for alcohol at any point between the last and the current data transmission.

Resetting the wage supplement value. If a participant removes their wearable alcohol biosensor without permission or provides a transdermal alcohol concentration reading that is positive for alcohol, the value of the wage supplement will be reduced to $1 per hour. The value of the wage supplement will be increased by $1 per hour for every day that the participants wear their wearable alcohol biosensor and provide transdermal alcohol concentration readings that are negative for alcohol.

Usual Care Control Group

Participants assigned to the Usual Care Control group will be offered counseling and referrals to employment and treatment services, and will be paid (see below) for wearing a wearable alcohol biosensor (SCRAM or BACtrack Skyn) for 6 months.

Standard Treatment Services

Participants in this research will have completed an inpatient alcohol detoxification at the Chemical Dependency Unit (CDU) or will be referred to treatment at the CDU, if necessary. The CDU is a 20-bed inpatient acute detoxification program for drug and/or alcohol addiction.

We will provide appropriate referrals to address patient needs in the areas of housing, and mental and medical health. Most importantly, we will assist patients in finding shelter/housing and encourage them to use Therapeutic Workplace earnings to pay for shelter. We will attempt to guide patients to seek available social service benefits, and to utilize Baltimore City's network of emergency shelters, transitional shelters, and motel placements, as needed. We may provide participants with transportation via Lyft or Uber, and cover transportation costs, when participants are traveling to and from our research unit.

Other Training and Employment Activities

Academic and computer skills training. Participants may have access to training in typing, keypad, general computer use, reading, spelling, math, GED preparation, and the use of Microsoft computer applications. We may evaluate the effectiveness of the academic and computer skills training programs by giving participants tests, such as the Wide Range Achievement Test, before and after participants complete a portion of or the entire training program.

Review and expungement of criminal record. Criminal records are a major barrier to competitive employment in homeless adults. To help participants prepare for competitive employment, we may collaborate with community partners (e.g., Maryland Legal Aid) who offer free legal assistance to participants. This assistance typically consists of determining eligibility for expungement, processing petitions for expungement of criminal records, and other free services approved by the legal team. Participants are notified by research staff that legal assistance is available, and that participation is voluntary. We may collect data to describe and evaluate the expungement process so we may better understand legal barriers to employment in homeless adults. The data we would collect are the types of offenses participants have on their public records (i.e., records available to potential future employers), the number of convictions on record, which records are eligible or ineligible for expungement, whether petitions for expungement are filed by the legal team, whether petitions for expungement are granted or require a hearing, and how long it takes for participants to have their records expunged. We may publish an article to describe the expungement process and de-identified data of our participants. All data that we collect and publish on the criminal histories of our participants will be data that are publicly available.

Verification of employment. To gain verified and objective records of employment, we may get an objective measure of each participant's employment history by getting each participant's earnings history using federal Form SSA-7050-F4 (10-2016) UF, REQUEST FOR SOCIAL SECURITY EARNINGS INFORMATION. Participants and research staff will complete this form and have the participant's earnings history sent to our research unit. Our research unit will pay for the costs of this service. We may request these documents one or more times. We will take the following steps to protect this sensitive information in our study databases: (1) when storing a completed form, we will redact name, date of birth, and social security number from the written document and label the document with an ID number; (2) keep paper copies in a locked file cabinet in a locked office and never keep documents out while unattended by research staff; and (3) only enter relevant information into the database (i.e., information about when participants worked, how much they earned, and what type of employment they had). The risks associated with collecting this information are explained on the consent form.

b. Study duration and number of study visits required of research participants.

Participants will be invited to enroll in Phase 1 of the therapeutic workplace for 1 month. All participants that report to be assessed at the end of Phase 1 and are willing to continue to wear a wearable alcohol biosensor will be randomly assigned to the study groups and followed for 6 months. All participants will be invited to participate in an intake assessment to determine eligibility and characterize the population. Outcome assessments will be conducted immediately prior to random assignment, every 30 days throughout the 6-month intervention evaluation period after random assignment and then at 6 and 12 months after the end of the intervention evaluation period. These assessments may be collected using REDCap and conducted via phone or web-conferencing.

c. Blinding, including justification for blinding or not blinding the trial, if applicable.

NA

d. Justification of why participants will not receive routine care or will have current therapy stopped.

NA

e. Justification for inclusion of a placebo or non-treatment group.

NA

f. Definition of treatment failure or participant removal criteria.

Participants will be removed from the study if they threaten the safety of CLH staff or other research participants, or of any other persons on the Johns Hopkins Bayview Campus.

g. Description of what happens to participants receiving therapy when study ends or if a participant's participation in the study ends prematurely.

Throughout the study, participants will be given referrals to services they might need (e.g., drug counseling, housing, medical, or employment services).

5. Inclusion/Exclusion Criteria

Inclusion criteria: a) 18 to 55 years old; b) homeless at the time of intake as defined by the McKinney-Vento Homeless Assistance Act (lacked a fixed, regular, and adequate nighttime residence including staying in a shelter, on the street, in an abandoned house or building, a car, or a park); c) unemployed; d) meet DSM V criteria for alcohol use disorder; and e) interested in obtaining employment. Exclusion criteria: a) report current suicidal/homicidal ideation; b) currently have nickel or other metal allergies, deep vein thrombosis, or leg ulcers where the SCRAM bracelet should be placed. Individuals excluded from the study will be linked with appropriate care as needed.

6. Drugs/ Substances/ Devices

a. The rationale for choosing the drug and dose or for choosing the device to be used.

NA

b. Justification and safety information if FDA approved drugs will be administered for non-FDA approved indications or if doses or routes of administration or participant populations are changed.

NA

c. Justification and safety information if non-FDA approved drugs without an IND will be administered.

NA

7. Study Statistics

a. Primary outcome variable.

Biologically-Verified Alcohol Abstinence (primary aim). Assess the effectiveness of IPS Plus Abstinence-Contingent Wage Supplements in promoting biologically-verified alcohol abstinence during the intervention. We will assess the number of days of alcohol abstinence (based on transdermal alcohol concentrations) during the 6 months after random assignment. *Primary Hypothesis:* Our primary hypothesis is that IPS Plus Abstinence-Contingent Wage Supplements will promote alcohol abstinence during the intervention after random assignment relative to Usual Care Control.

b. Secondary outcome variables.

Self-Reported Alcohol Use (secondary aim). Assess the effectiveness of IPS Plus Abstinence-Contingent Wage Supplements in reducing self-reported alcohol use during the intervention. We will use three self-report measures of alcohol use (based on TLFB) during the 30 days prior to each of the 6 monthly assessments during the year after random assignment. We will assess: 1) the percent of days abstinent from alcohol; 2) the average number of standard drinks per drinking day ingested; and 3) the percent of heavy drinking days (≥5 standard drinks per day for men and ≥4 standard drinks per day for women). *Hypothesis:* We expect that IPS Plus Abstinence-Contingent Wage Supplement participants will have less self-reported alcohol use during the intervention after random assignment relative to Usual Care Control.

Employment (secondary aim). Assess the effectiveness of IPS Plus Abstinence-Contingent Wage Supplements in promoting employment during the intervention. We will assess the number of days participants are employed during the 30 days prior to each of the 6 monthly assessments during the intervention after random assignment. *Hypothesis:* We expect that IPS Plus Abstinence-Contingent Wage Supplements will increase employment during the intervention after random assignment relative to Usual Care Control.

Post-Intervention Effects (secondary aim). Assess the effectives of IPS Plus Abstinence-Contingent Wage Supplements in promoting employment and abstinence from alcohol after the intervention ends. We will compare the groups on self-reported measures of alcohol use and employment at 6- and 12-month follow-up assessment time points after the intervention ends. *Hypothesis:* We expect that IPS Plus Abstinence-Contingent Wage Supplements may need to be maintained to promote long-term employment and abstinence from alcohol, and thus alcohol abstinence and employment may not be sustained after the intervention ends.

Economic Outcome Measures

Costs of Treatment (secondary aim). Assess the costs of treatment for Usual Care and IPS Plus Abstinence-Contingent Wage Supplements. We will assess the total cost per participant in both study groups. *Hypothesis:* We expect that treatment costs for IPS Plus Abstinence-Contingent Wage Supplements will be higher per person relative to Usual Care due to the IPS and wage supplements and because we expect that IPS Plus Abstinence-Wage Supplement participants will have greater treatment engagement.

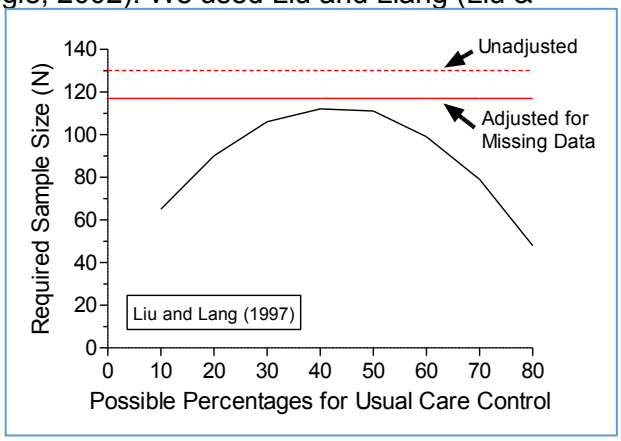
Cost-Effectiveness (secondary aim). Assess the cost-effectiveness of IPS Plus Abstinence-Contingent Wage Supplements. Separate cost-effectiveness analyses will be conducted for the outcomes of alcohol use, employment, and homelessness. We will assess incremental cost-effectiveness ratio (ICER) by dividing the difference in costs of two interventions by the difference in the effects of the two interventions. The estimated ICER can be interpreted as dollars spent per unit of desired outcomes gained. *Hypothesis:* We expect that IPS Plus Abstinence-Contingent Wage Supplements will yield better ICERs for all measures.

Cost-Benefit (secondary aim). Assess the cost-benefit of IPS Plus Abstinence-Contingent Wage Supplements. We will perform a Cost-Benefit Analysis (CBA) to examine the monetized benefits relative to costs for the two groups. The economic outcomes are employment, crime, subsidized housing, and health care utilization. *Hypothesis:* We expect that IPS plus Wage Supplement will yield greater economic benefits in the 18-month post random assignment time period relative to the costs of Usual Care.

c. Statistical plan including sample size justification and interim data analysis.

Power Analysis

The primary outcome measures will be analyzed with a longitudinal binominal regression model using generalized estimating equations (GEE; Diggle & Diggle, 2002). We used Liu and Liang (Liu & Liang, 1997) to determine the total N required to detect differences between groups with 80% power. The adjacent figure shows the total number of participants (N) that would be required to detect a difference of 15% between the Usual Care Control and the IPS Plus Abstinent-Contingent Wage Supplement with the monthly assessments. The figure shows possible percentages for the Usual Care Control group because that value affects the sample size required. Fifteen percent is smaller than any difference in any Therapeutic Workplace study in which we promoted alcohol abstinence in homeless adults or cocaine abstinence in methadone patients (see figure in "Significance Section"). The horizontal red lines show the number of participants planned based on the number of participants randomized to the two groups without (top dashed red line) and after adjusting for the anticipated rates of missing data (10% missing, bottom solid red line). Based on this analysis, we need to randomize 130 participants (dashed red line) to ensure that we have sufficient sample sizes after adjusting for the rates of missing data. After adjusting for missing data (10% missing), this would yield a sample size of 117 participants (130 participants x 0.90 collected assessments = 117 participants). The adjusted sample size of 117 participants (solid red line) is a little more than the maximum number of required participants.



Main Statistical Analyses

Main analysis. All measures assessed repeatedly will be analyzed with a longitudinal binominal regression model. Within-person correlated outcomes will be handled using GEE (Zeger et al., 1988). Measures assessed once will be analyzed using logistic regression. The magnitude of effect for both

regression and GEE will be expressed using odds ratios with 95% CI. Analyses will include all randomized participants as intent-to-treat, and will be adjusted for pre-specified covariates used for stratification (Pocock et al., 2002). Tests will be two-sided and, because we have one primary outcome, alpha will be set at 0.05. Based on our previous experience, we expect rates of attrition at monthly visits to be low. If rates are higher than expected, we will use mixed effects models rather than GEE estimation, as the former has less strict assumptions regarding missing data (MAR, rather than MCAR). If it appears that the missing data are MNAR, then we will fit pattern mixture models as described by Hedeker & Gibbons (1997).

Missing data. We expect to collect >90% of assessments. Our approach to handle missing data will be to impute all missing values as the adverse outcome (e.g., alcohol positive). Model parameter estimates from this approach will be compared to a method without imputation. If these methods yield differing results, conclusions will need to be tentative, but results from both approaches will be reported in publications. To investigate sensitivity to missing values, participants with and without missing values will be compared by covariates and treatment assignment. If rates of missingness are higher than expected, we may use multiple imputation (Rubin, 1996) or pattern mixture models (Hedeker & Gibbons, 1997) to obtain unbiased estimates of treatment effects.

Consideration Of Sex And Other Variables In Moderating The Outcomes

We will conduct analyses to identify biological and other variables that moderate the outcomes of employment and alcohol abstinence. We will examine efficacy differences as a function of four variables assessed prior to random assignment by including interaction terms in our regression models: 1) Percent of days abstinent from alcohol (based on transdermal alcohol concentrations) prior to random assignment. 2) Opiate- and cocaine-negative urine samples from the assessment prior to random assignment. 3) Completed high school or obtained a GED; and 4) gender (male/female). Alcohol use and opiate/cocaine use prior to random assignment should be associated with higher rates of alcohol use and lower rates of employment during the 6 months after random assignment. We expect that high school completion or obtaining a GED will be associated with higher rates of employment. Gender is a key biological factor that may influence outcome. We also expect that the effect of IPS Plus Abstinence-Contingent Wage Supplements will be affected by these variables.

Balancing of potential moderators of treatment response via urn randomization merely ensures that the estimation of the treatment effect is unbiased. Balancing the randomization by these variables allows for them to be adjusted for in subsequent analyses. It does not take the place of these adjustments. Moderator analysis entails fitting a model with the main effects of treatment and the putative moderating variable, and their interaction. Likewise, balancing the variables during randomization does not take the place of fitting this interaction. For more discussion, see Pocock et al. (2002).

We will conduct similar analyses to identify variables that moderate outcomes on employment and alcohol use during the follow-up year after the interventions have ended. We will examine differences in outcomes during the follow-up year as a function of three variables assessed at the end of the intervention period by including interaction terms in our regression models: 1) Percent days abstinent from alcohol from the last 3 months under the study interventions; 2) percent of opiate- and cocaine-negative urine samples from the last 3 monthly assessments under the study interventions; 3) Highest hourly wage that each participant earned during the year after random assignment. We expect that alcohol and opiate/cocaine use during the last 3 months under the study interventions will be associated with higher rates of alcohol use and lower rates of employment during the follow-up year. We expect that the highest wage achieved under the study interventions will be associated with higher rates of employment and lower rates of alcohol use during the follow-up year.

Economic Analyses

Our economic evaluation will be done from the provider perspective.

Cost Analysis. We will derive cost estimates of intervention activities following an activity-based approach (Drummond et al., 2005; Gold et al., 1996; Zarkin, Dunlap et al., 2004; Zarkin et al., 2005; Zarkin, Dunlap, et al., 2008). The total cost per participant of each intervention will be the sum of the cost for (1) staff labor, (2) building space, (3) wage supplements, and (4) supplies or materials. The total intervention cost for each participant is the cost per activity multiplied by the number of activities or services received by the participant. Taking the mean across participants in an intervention yields the mean per participant cost of that intervention. Treatment attendance will be captured in the modified Economic Form 90 AIR/ED. Standard addiction treatment costs will be drawn from the literature (e.g., Zarkin et al., 2004).

Cost-Effectiveness. Our Cost-Effectiveness Analysis (CEA) methodology (e.g., Zarkin et al.,1996, 1997, 2008; Dunlap et al., 2010) will combine the cost estimates (above) with intervention effectiveness measures. Separate cost-effectiveness analyses will be conducted for alcohol use, employment, and homelessness. The incremental cost-effectiveness ratio (ICER) is calculated by dividing the difference in costs of two alternatives by the difference in effects of the alternatives. The estimated ICER can be interpreted as dollars spent per unit of desired outcomes gained (e.g., $300 per day abstinent). To gauge ICER sampling uncertainty, we will calculate the CI via nonparametric bootstrap methods (Indurkhya et al., 2001; Briggs et al., 2006). We will estimate cost-effectiveness acceptability curves (CEAC) using nonparametric bootstrap methods (e.g., Dunlap, et al., 2010; Zarkin et al., 2008). The CEACs show the probability that a treatment is cost-effective as a function of the policy maker's intrinsic valuation/willingness to pay for the clinical outcome.

Cost-Benefit. We will perform a Cost-Benefit Analysis to examine the monetized benefits relative to costs for the two study conditions. The key economic outcomes are employment, crime, and health care utilization assessed through the modified Economic Form 90 AIR/ED. The unit costs of these outcomes will be drawn from literature and public data sources (e.g., Zarkin et al, 2010).

Sensitivity Analysis. We will conduct sensitivity analyses to assess whether the economic results are affected by changes in model parameters. We will perform one-way sensitivity analyses in which we examine the effect of changing one of the model parameters while holding all other parameters constant. We will perform *n*-way sensitivity analyses in which *n* parameters of the model are varied jointly, holding other parameters constant.

Northern Michigan University

Dr. Forrest Toegel and his team are at Northern Michigan University and will see and handle de-identified data for this protocol. The Northern Michigan University IRB has determined that Dr. Toegel team's part in the research (analyzing de-identified data) is exempt. The letter from the Northern Michigan University IRB is uploaded below.

Here is NMU's Scope of Work for this project. Northern Michigan University will assist in preparing the data for analyses, and preparing and submitting manuscripts for publication and presentation. Forrest Toegel is an Assistant Professor at Northern Michigan University. Under Dr. Toegel's supervision, research assistants will work with research staff at Johns Hopkins University School of Medicine to prepare the study data for analyses, and summarize and graph data for reports, publication, and presentation.

d. Early stopping rules.

The protocol will be stopped if the Data Safety Monitoring Board recommends that the protocol be stopped due to unexpected rates of adverse events related to the protocol.

8. Risks

a. Medical risks, listing all procedures, their major and minor risks and expected frequency.

There is essentially no risk above those of normal daily living associated with the training or work in the Therapeutic Workplace, with participation in the Individual Placement and Support program, with obtaining employment in community workplaces, with the incentive program, or with the data collection procedures used in these studies.

Side effects may occur from wearing a SCRAM bracelet. These include sores, open wounds, bruising, skin irritation and redness. Individuals who currently have nickel or other metal allergies, deep vein thrombosis, or leg ulcers may be more likely to experience side effects of wearing SCRAM.

Side effects may occur from wearing a BACtrack Skyn bracelet. These include skin irritation and redness.

b. Steps taken to minimize the risks.

We will take several steps to minimize the risks associated with wearing SCRAM. Participants will be taught how to clean around and underneath their SCRAM bracelets to minimize the risk of developing side effects. Study staff will inspect the area surrounding participants' bracelets for skin redness, sores, bruising, or irritation when participants attend the research site to transmit the data stored on their bracelets. The bracelet may be loosened or switched to the other ankle. Participants who experience sores, open wounds, or severe bruising, irritation or redness will be seen by the study clinician, who will determine whether the participant may continue wearing SCRAM.

To protect confidentiality, all research participants are identified by participant identification codes (Participant IDs) consisting of their initials and sequentially-assigned participant numbers on most forms and data files, and not by their names. Picture ID cards are maintained by staff in a locked container, and kept in a locked, secured area when not in use. All research data are stored in locked areas accessible only to research staff and are not left unattended. Documents with confidential information are shredded before being discarded. Confidential information is never given to anyone outside of the research program without the explicit written permission of the research participant. Only selected designated staff members are approved to give confidential information out after obtaining explicit written permission from the participant. All research staff are trained in these procedures. We collect only general information about participant activities, legal and illegal. We do not collect information about specific illegal acts. In addition to these procedures, all persons who visit or work at the Center for Learning and Heatlh are required to sign a confidentiality agreement, in which they agree not to disclose any confidential information that they may become aware of in the course of their time at the center. All participants are also invited to take a break and leave the workplace when visitors come to the Center for Learning and Health. To further protect confidentiality, we will obtain a confidentiality certificate from NIH to protect data collected in this study. Finally, to protect the confidentiality of participants who become employed in a community job, we will not interact with an employer unless the participant gives explicit written permission.

c. Plan for reporting unanticipated problems or study deviations.

Unanticipated problems or study deviations will be reported based on the guidelines of the Johns Hopkins University School of Medicine IRB.

d. Legal risks such as the risks that would be associated with breach of confidentiality.

There are risks that the confidential information we collect could be revealed to people not involved in the research such as a friend, relative, or an outside organization. This could be embarrassing to the participant if the participant wanted to keep participation in the study secret. The legal risks are limited because we collect only general information about participant activities, legal and illegal. We do not collect information about specific illegal acts. Thus, the risks associated with the assessments are not greater than the risks associated with routine psychological examinations or tests.

e. Financial risks to the participants.

There are no financial risks above those of normal daily living. Each participant is responsible for ensuring that the earning of incentives is reported properly to relevant government or private agencies and for determining whether or not the earnings will affect any benefits they might receive from those agencies.

9. Benefits

a. Description of the probable benefits for the participant and for society.

Benefits for the participant. All participants will have access to training in skills that could be useful in obtaining employment. Training will be provided in typing, keypad, general computer use, reading, math, GED preparation, and the use of Microsoft computer applications. IPS supported employment will be provided to help participants become employed. Since all participants in this study will be unemployed at the start of the study, this experience could help prepare participants for employment.

All participants will receive monetary incentives for participating in the Therapeutic Workplace during the first month of the study. Participants in the IPS Plus Abstinence-Contingent Wage Supplements group will get abstinence-contingent incentives for engaging in IPS supported employment and for obtaining and maintaining competitive employment. These incentives should increase participation in the Therapeutic Workplace, development of job skills, employment, and abstinence from alcohol. The earnings and payments could also have the benefit of providing a means of purchasing things that the individual would not otherwise be able to afford, including housing.

Benefits for society. The study will evaluate the effectiveness, cost-effectiveness, and cost-benefit of IPS Plus Abstinence-Contingent Wage Supplements in increasing employment and promoting long-term alcohol abstinence. This novel intervention could be an effective and economically sound means of promoting long-term alcohol abstinence and employment in homeless adults with alcohol use disorder, a population at considerable risk for a range of adverse outcomes including HIV because of

their poverty, unemployment and continued alcohol use. If participants complete the job training and use IPS supported employment services, they could become employed which could reduce their need for government services. If employed, they could also contribute to the overall tax revenue generated in their community. If the job skills training and employment program increases the employment of participants, it could reduce their poverty and reduce transmission of poverty to their children.

10. Payment and Remuneration

a. Detail compensation for participants including possible total compensation, proposed bonus, and any proposed reductions or penalties for not completing the protocol.

All incentives in this study will be provided by giving participants reloadable credits and adding incentives to the card when earned. Restrictions can be placed on these cards to restrict where they can be used to make purchases. We have been using these reloadable credit cards in our ongoing research and they have proved attractive to participants and convenient for staff to manage.

Phase 1 Induction and Training Incentives. All participants will be invited to enroll in the Therapeutic Workplace induction period for 1 week, where they can earn $20 every weekday or a total of $100. Participants who complete the induction period will be invited to enroll in the Therapeutic Workplace for about 3 weeks, where they can earn about $32/weekday for participating in our job skills training program. In total, participants will be able to earn $580 in Phase 1.

Phase 2 Abstinence-Contingent Wage Supplements. Participants in the Abstinence-Contingent Wage Supplement group will be able to earn wage supplements of up to $8 per hour for up to 40 hours per week for 24 weeks. In total, participants in the Abstinence-Contingent Wage Supplement group will be able to earn up to $7,680 in wage supplements.

Participant payment for wearing alcohol biosensor. Participants can earn daily pay for wearing their wearable alcohol biosensor. Participants can earn $0.25 per hour for wearing their alcohol biosensor and can earn a $5 bonus for wearing their alcohol biosensor for at least 18 hours per day. However, to receive the daily payment participants must receive permission to remove their bracelet by sending research staff a photo or video of themselves wearing the bracelet after they put the bracelet back on. In total, participants could earn a maximum of $11 per day for wearing their biosensor.

Participant payment for assessments. Assessments will be conducted for all participants at intake to determine eligibility and characterize the population, immediately prior to random assignment, every 30 days throughout the 6-month intervention evaluation period after random assignment and then at 6 and 12 months after the end of the intervention evaluation period. Participants will be paid $30 for the intake and monthly assessments during the 1-month training period and the 6-month intervention evaluation period, and $50 for the assessments conducted 6 and 12 months after the end of the intervention evaluation period. In total, participants will be able to earn up to $340 for completing the assessments in this study.

Participant referral fees. As in our previous studies, participants will have the optional opportunity to earn incentives for referring people who are interested in the study. If a referral attends the initial screening appointment and completes the necessary assessments, the participant who referred the person will receive up to $20. If a referred person enrolls in the main study, the participant who referred the person will receive up to $40 for making the referral.

Device Return. To help ensure that participants return their wearable alcohol biosensor bracelets after their study participation ends, participants will be able to earn $100 for returning the bracelet to our staff.

11. Costs

a. Detail costs of study procedure(s) or drug (s) or substance(s) to participants and identify who will pay for them.

There will be no costs to participants for any services or treatment provided in this study. All procedures in the study will be paid for out of grant funds.