

## **Proposed Measures & Variables:**

### **Outcome Variables Definition and Measurement**

The primary outcome measure for this study is the proportion of individuals who are abstinent in each group. This outcome measure will be determined by urinalysis, breathalyzer tests, and self-reports at quarterly assessments that will occur every three months throughout the two-year protocol. Secondary outcome measures include duration of continuous abstinence and number of non-drug using activities. These outcome measures will be assessed using urinalysis, breathalyzer tests, and self-reports at bi-monthly assessments that will occur every 2 weeks during the first year of the protocol.

*Abstinence measures.* Urine specimens will be provided under staff observation and will be temperature and adulterant tested to ensure veracity, then immediately screened for the presence of cocaine, marijuana, benzodiazepine, and opiate metabolites via BioTechNostix E-Z integrated test cups. Breath samples will be tested for the presence of alcohol using an Alco-Sensor III breathalyzer.

Self-report data on abstinence will be collected using the Life History Interview (LHI) (Simeone, 2003). The LHI is a computer-based instrument that assists participants in recalling the frequency of their drug use during a specified period of time. It uses six domains (medical, employment, alcohol and drug, legal, family and social, and psychological) to help the participant organize life events that occurred during the specified time period. Once the events are organized, participants are asked to recall the frequency of substance use that occurred around these events.

Self-report information will also be measured using the Drug and Alcohol Use Sections of the Addiction Severity Index (ASI) (McLellan, *et al.*, 1991; McLellan, Kushner, *et al.*, 1992). The ASI is a semi-structured interview that assesses clients' functioning in seven domains: psychiatric status, physical health, employment status, legal status, alcohol use, drug use, and family/social functioning. Subjects provide data on the frequency of events indicative of adaptation or dysfunction in each domain.

*Non-drug using activities.* Several instruments will be used to collect this information including the Pleasant Events Scale, the Quality of Life Enjoyment and Satisfaction Questionnaire, the Revised Survey of Treatment Entry Pressures – University of Pennsylvania, the Comprehensive Quality of Life Scale, and the Lifestyle Changes Questionnaire.

The Pleasant Events Scale (PES) (MacPhillamy & Lewinsohn, 1982) is a self-report inventory that consists of 320 items that break into seven scales. The items describe potentially reinforcing events which participants are asked to rate each item in terms of frequency and enjoyability.

The Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) (Endicott *et al.*, 1993) does not specifically examine the availability of reinforcement for non-drug use activities. As such, we have chosen to supplement this standardized measure with the Revised Survey of Treatment Entry Pressures – University of Pennsylvania (STEP-UP) (Marlowe *et al.*, 1996, 2001), which is a reliable measure that has been developed to detect naturally-occurring environmental influences on treatment entry behavior (as described below). We will revise the instrument to monitor naturally-occurring environmental influences on non-drug using activities.

The original STEP-UP is a brief interview designed to assess sources of pressure for treatment entry. These pressures are conceptualized in terms of life domains, reinforcement schedule, and whether or not the consequence is socially-mediated. Participants are asked (a) “What made you decide to enter treatment at this time?”, (b) “What problems was substance abuse causing you that lead you to seek help now?”, (c) “What advantages do you envision as a result of entering treatment?”, and (d) “Who or what may have influenced you to seek help now?” Participants were also asked to rate the importance of each response to their decision to enter treatment on a 3-point Likert Scale. Criteria for tabulating participants’ responses are clearly specified and scoring agreement exceeds .80. We will use the information gathered from the Q-LES-Q to orient the participants to the non-drug using behaviors that they report. Then the STEP-UP questions will be revised to ask (a) “What made you decide to do these activities at this time?”, (b) “Have any problems discouraged you from engaging in these activities?”, (c) What advantages do you envision as a result of doing these activities?”, and (d) “Who or what has recently influenced you to engage in these activities?”. Participants will also be asked to rate the importance of each response to their decision to engage in the activities on a 3-point Likert Scale. We will use the same procedures developed with the original STEP-UP to tabulate and specify participants’ responses, as well as score and monitor agreement.

The Comprehensive Quality of Life Scale (ComQol) (Cummings,1997) is used to assess the emergence of new behaviors that are incompatible with drug use. The ComQol is consists of seven separate domains (material-well being, health, productivity, intimacy, safety, place in community, and emotional well-being) that can be addressed objectively and subjectively, separately or in combination. For our purposes, we will focus on the objective assessment of the productivity, intimacy, and place in community subscales. These subscales collect objective information about specific activities (e.g., average hours per week spent working, providing unpaid childcare, watching TV, talking with friends, and times per month going to sporting events, a place of worship, a restaurant, etc.).

The Lifestyle Changes Questionnaire (Silverman, 1999) presents 12 items/activities and instructs participants to rate how much each item/activity stopped, reduced, or helped them to avoid cocaine or heroin use.

*Additional Instruments.* Further information on participants’ drug use will be collected using the Drug Availability Questionnaire and the Staff Appearance Visual Analog Scale. We will also be collecting information on motivation/craving using the Drug Taking Confidence Questionnaire, on general life functioning using the ASI, on HIV risk using the Risk Assessment Battery, on treatment status using the ASI, and on readiness to change using the Stages of Change Readiness and Treatment Eagerness Scale.

The Drug Availability Questionnaire (Silverman, 2003) consists of 6 questions that assess how accessible cocaine and heroin are to the participants. Questions cover topics such as whether anyone has offered to sell them cocaine or heroin, and whether they are able to get cocaine or heroin from someone living in their home.

The Staff Appearance Visual Analog Scale (Silverman, 2003) – The staff appearance visual analog scale is completed by the staff member who administers the assessment battery. It requires staff members to rate participants on odor, healthy appearance, clothing, personal grooming, and overall appearance.

Drug Taking Confidence Questionnaire (DTCQ) (Annis & Graham, 1985) - The DTCQ is a self-report instrument that looks at self-efficacy in substance-related situations. Participants are asked to rate how confident they are that they would be able to resist using cocaine or heroin in a variety of situations.

The Risk Assessment Battery (RAB) (Center for Studies of Addiction, 1995). The RAB is a self-report measure consisting of 29 items. This instrument focuses on HIV risk behaviors, including sex- and drug-related behaviors. It is included because studies have shown smoking crack cocaine places individuals at increased risk of HIV infection (Chiasson *et al.*, 1989, 1991; Chirgwin, *et al.*, 1991; Booth *et al.*, 1993; Edlin *et al.*, 1994; Inciardi *et al.*, 1993), probably because crack users are more likely than non-users to engage in high-risk sexual behaviors (Booth *et al.*, 1993; Edlin *et al.*, 1994; Kral *et al.*, 1998).

The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) (Miller & Tonigan, 1996) –SOCRATES is a self-report instrument that is designed to assess readiness for change in substance abusers. The instrument consists of 19 items that ask participants to rate their feelings about their substance use. SOCRATES produces three factorially-derived scale scores: Recognition, Ambivalence, and Taking Steps.

### **Independent Variable Definition**

Participants in both groups will receive the standard drug counseling that is provided in the community methadone maintenance clinic they are attending. In addition to receiving treatment as usual, all participants will engage in the CM program. Participants will be randomized to two CM conditions via an urn randomization procedure (Wei, 1978; Wei & Lachin, 1988) that ensures an approximately balanced allocation of intake urinalysis status (dichotomized as cocaine positive or cocaine negative) across the two CM conditions.

Half of the participants will be assigned to receive a standard schedule of CM. It involves a 12-week *escalating schedule* of reinforcement to initiate cocaine abstinence, followed by a 12-week *aftercare* phase. The other half of the participants will be assigned to receive an extended schedule of CM. It involves a 36-week *escalating schedule* of reinforcement to initiate and sustain short-term cocaine abstinence, followed by a 12-week *aftercare* phase.

*Escalating Schedule.* For both groups, vouchers will be provided for urine specimens testing negative for cocaine and opiates. The value of the vouchers will begin at \$2.50 for the first negative specimen, increase in value by \$1.25 for each subsequent consecutive negative specimen, up to a maximum of \$40.00. Bonus vouchers worth \$10 will be awarded for each three consecutive cocaine-negative specimens until the value of the vouchers reaches \$40.00 at which point the bonuses will be discontinued. Specimens that test positive for cocaine and/or opiates, and failures to provide scheduled specimens will reset the value of the vouchers to \$2.50, from which they will escalate again according to the same schedule. Submission of five consecutive cocaine-negative and opiate-negative samples after the provision of a positive sample will return the value of the voucher to the point they were at prior to the reset.

*Aftercare.* Upon completion of the escalating schedule, both groups will receive a \$1.00 state lottery ticket for each negative specimen (i.e., an FR1 schedule of reinforcement). This will continue for 12 weeks. At the end of 12 weeks of aftercare, the contrived contingencies will be discontinued.

