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APPLICATION OF CONTINGENCY MANAGEMENT-PRIZE REINFORCEMENT TO COMMUNITY PRACTICE WITH ALCOHOL AND DRUG PROBLEMS: A CRITICAL EXAMINATION

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ABSTRACT: Contingency management prize reinforcement (CM-PR) is a highly successful intervention for drug or alcohol dependence that shows improved outcomes over standard methadone maintenance and counseling, and 12-step disease model outpatient counseling. CM-PR treatment for individuals with substance abuse problems is examined by applying criteria for choosing an intervention. CM-PR is applied to Codes of Ethics from professional organizations of behavior analysts, chemical dependency counselors, psychiatrists and addictionologists, psychologists, nurses, and social workers that are major providers of substance abuse treatment. Limitations of using CM-PR in community treatment are discussed.

KEYWORDS: contingency management-prize reinforcement, community reinforcement approach, substance abuse treatment

Contingency management (CM) addiction treatment is based on the operant theory (Skinner, 1938/1953) that behaviors are maintained depending upon the consequences following those behaviors, and that reinforcement of behaviors increases the probability that they will re-occur. In drug treatment, CM reinforcers are often contingent upon attendance, abstinence, and engagement in non-drug-related behaviors. If the magnitude of the reinforcer is strong enough to compete with drugs, reinforcers become more desirable than drug use. As the drug-using relationship weakens, participants may begin to prefer abstinence (Higgins, 1997).

A contingent relationship that maintains drug dependency is explained by the equation:

$$A^1 \rightarrow B^1 \rightarrow C^1 \rightarrow A^2 \rightarrow B^2 \rightarrow C^2 \dots,$$

where A = antecedent; B = behavior; and C = consequence. Drug dependency can be maintained if the urge to use (A^1 , cravings) is immediately followed by drug use (B^1) which is then immediately followed by a positive consequence (C^1 , euphoria). Metabolism of the drug may then result in the return of cravings or

“narcotic hunger” (Ludwig & Wikler, 1974). These cravings result in an increase in drug seeking behaviors (Bigelow, Stitzer, Griffiths, & Liebson, 1981) which become the antecedent (A^2) of the next response chain. This model of drug use, or self-administration, is maintained by positive and negative reinforcement. The euphoria of initial drug using behavior is positive reinforcement, while avoiding withdrawal is negative reinforcement.

Pivotal psychopharmacological studies of drug self-administration found that most drugs that animals will self-administer are the same drugs that humans choose to use (Bigelow et al., 1981; Schuster, Fischman, & Johanson, 1981), and are drugs humans often rate as having 'euphoric' effects (Schuster et al., 1981). However, subjective sensations of euphoria are not always positively correlated with self-administration (Beecher, 1959; DeWit, Johanson, Uhlenhuth, & McCracken, 1983; Schuster et al., 1981). The strength of the contingent relationship of self-administration and interoceptive stimuli of drugs depends upon several factors. They include individual differences among users (Beecher, 1959; DeWit et al., 1983; Johanson & Uhlenhuth, 1980), conditions that precede use (Carroll & Boe, 1982), the amount of work it takes to obtain the drug (Bigelow et al., 1981), and the amount of isolation, or loss of social interactions, from drug or alcohol use (Azrin, 1976; Bigelow et al., 1981; Hunt & Azrin, 1973; Stitzer, Griffiths, Bigelow, & Liebson, 1981).

BACKGROUND LITERATURE

In studies comparing contingency management (CM) treatment to other substance abuse treatment approaches, participants randomly assigned to groups that received reinforcement contingent upon abstinence, were more likely to initiate and maintain abstinence from cocaine (Higgins et al., 1991, 1993, 1994; Schottenfeld et al., 2005; Silverman, Higgins et al., 1996), as well as opioids (Silverman, Wong et al., 1996), and marijuana (Budney, Higgins, Radonovich, & Novy, 2000). Participants who received CM reinforcement for attendance remained in treatment longer, regardless of whether control groups were referred to treatment that provided community resources (Gruber, Chutuape, & Stitzer, 2000), standard methadone maintenance and counseling (Bickel, Amass, Higgins, Badger, & Esch, 1997; Silverman, Wong et al., 1996), Motivational Enhancement Therapy (Budney et al., 2000), vouchers that were not contingent upon attendance or abstinence (Heil et al., 2008; Higgins et al., 1991; Higgins, Wong, Badger, Ogden, & Dantona, 2000; Silverman, Higgins et al., 1996), or the Community Reinforcement Approach (CRA) (Higgins, Budney et al., 1994).

CRA was designed to apply environmental reinforcement as incentives to increase abstinence (Azrin, 1976; Hunt & Azrin, 1973; Meyers, Miller, Hill, &

Tonigan, 1999; Sisson & Azrin, 1986). In CRA clients are referred to components that include a Social Club, where they can learn to interact with non-drinking peers (Budney & Higgins, 1998; Meyers, Smith, & Lash, 2003), and a Job Club, where they can learn job readiness skills (Silverman, Svikis, Robles, Stitzer, & Bigelow, 2001; Wong, Dillon, Sylvest, & Silverman, 2004). Clients and their families are referred to family therapy and a family training component (Community Reinforcement and Family Training; CRAFT) (Meyers et al., 2003), to learn how to support their family member's abstinence by providing contingent reinforcement for adherence to the treatment plan (e.g. Antabuse, clinic appointment) (Sisson & Azrin, 1986).

CRA was combined with voucher reinforcers, exchangeable for services or retail goods, to enhance outcomes (Budney & Higgins, 1998; Higgins et al., 1991, 1993; Meyers, Villanueva, & Smith, 2005). However, early CM-voucher (CM-V) intervention studies that yielded significant reductions of drug use were thought to be too expensive for community use (Silverman, Robles, Mudric, Bigelow, & Stitzer, 2004; Silverman et al., 2001) because reinforcers potent enough to be preferred to drug use were costly (Higgins et al., 2006; Petry et al., 2004). For example, earned reinforcers for a 12 week intervention ranged from around \$600 (Higgins, Wong et al., 2000; Preston, Umbricht, Wong, & Epstein, 2001; Silverman et al., 1996) to approximately \$1000 (Budney, Higgins, Delaney, Kent, & Bickel, 1991; Downey, Helmus, & Schuster, 2000; Epstein, Hawkins, Covi, Umbricht, & Preston, 2003; Higgins et al., 1991, 1993, 2000; Higgins, Budney et al., 1994; Silverman, Wong et al., 1996; Silverman et al., 1998).

To reduce costs of reinforcers and make behavioral treatment more affordable, Petry developed contingency management prize-reinforcement (CM-PR), based on intermittent reinforcement (Ferster, 1958). In CM-PR treatment attendance, abstinence, or completion of targeted non-drug-related behavior is reinforced with the opportunity to draw from a prize bowl (Iwata, Bailey, Brown, Foshee, & Alpern, 1976; Muir & Milan, 1982), a slip of paper designated with a value exchangeable for prizes. The ratio of slips of paper that yield a prize versus slips that provide encouragement only, can be changed to manipulate the probability of drawing a slip worth prizes. A typical prize bowl contains 250 pieces of paper; half having an encouraging message ("Good job"). The remaining slips of paper contain 109 worth \$1 in prizes, 15 worth \$20 in prizes, and one worth \$100 in prizes. To provide immediate reinforcement, prizes are kept accessible in the counselor's office and include gift certificates, small electronic devices, toiletries, and baby items. Reinforcers such as cigarettes and alcohol are forbidden.

Compared to 12-Step oriented psychoeducational counseling without a CM component, CM-PR predicted higher rates of abstinence (Peirce et al., 2006; Petry, Alessi, Hanson, & Sierra, 2007), more weeks of continuous abstinence (Peirce et al., 2006; Petry, Alessi, Marx, Austin, & Tardiff, 2005), and more days until relapse to heavy drinking and drug use (Petry, Martin, Cooney, & Kranzler, 2000). CM-PR has shown improved outcomes when the possible earned magnitude of reinforcer was set at \$240 (Petry et al., 2004) and \$350 (Olmstead, Sindelar, & Petry, 2007; Petry et al., 2007; Sindelar, Elbel, & Petry, 2007), but not at \$80 (Petry et al., 2004; Sindelar et al., 2007), per 12 weeks, per patient.

Two studies compare costs and outcomes of CM-PR and CM-V (Petry et al., 2005, 2007). In Petry and colleagues (2005), the prize system was designed so the maximum reinforcer, 575 draws from the prize bowl, was equivalent to the maximum voucher reinforcer (\$882). Participants were randomized to either an intensive outpatient treatment program (IOP), or IOP plus CM-PR, or IOP plus CM-V. Trends emerged showing that compared to participants in the CM-V group, those in the CM-PR condition remained in treatment longer (9.3 ± 3.7 weeks vs. 8.2 ± 3.8 weeks, p -value = 0.07), submitted fewer positive urine samples ($3.7\% \pm 9.8\%$ vs. $9.8\% \pm 19.5\%$, p -value = 0.08), and more patients remained continuously abstinent for the 12 weeks of treatment (45% vs. 28%, p -value = 0.08). While differences between CM-PR and CM-V approached significance, differences between both CM-PR and CM-V versus TAU were significantly better for all outcomes. There was no difference in the average value of vouchers earned ($\$335 \pm 288$) compared to average cost of prizes ($\$295 \pm 257$), and overall, this study indicates that when costs of reinforcers are similar, participants in the CM-PR have slightly better outcomes.

In Petry et al. (2007), the expected average maximum reinforcer of the CM-PR system (\$300) was designed to be 50% lower than CM-V earnings (\$585). Methadone-maintained clients were randomized to TAU, a 12-step oriented psychoeducational drug counseling and CBT, versus TAU plus CM-PR, versus TAU plus a CM-V condition. No differences emerged between the two CM groups in consecutive weeks of abstinence, but the proportion of urine samples that were cocaine-negative was higher for the CM-PR group versus the TAU group (p -value = 0.06). Participants in the CM-PR, but not the CM-V group, achieved longer durations of continuous abstinence (p -value < 0.03), and submitted more negative urine samples (67.4%, p -value = 0.06) than the TAU group. Thus, participants in the CM-PR group drew more reinforcers from the prize bowl, earning more reinforcement than the CM-V group. However, the median overall cost of actual reinforcers was similar between the CM-PR compared to the CM-V group (\$184 vs. \$228) indicating that Petry and colleagues

(2007) failed to support the original expectation that CM-PR is less costly than CM-V. However, the cost of implementing the prize reinforcement system is lower than the voucher system. Implementing a CM-PR component adds an estimated total of \$90 to \$136 per client during a 12-week intervention in inventory and staff costs (Olmstead, Sindelar, & Petry, 2007; Sindelar et al., 2007), versus \$422 to \$516 per client during an 8-week CM-V intervention (Olmstead, Sindelar, Easton, & Carroll, 2007), or \$633 to \$774.

SPECIFIC AIMS

The aim of this article is to examine whether CM-PR is an optimal intervention (Hepworth, Rooney, Rooney, Strom-Gottfried, & Larson, 2006, p.20) for substance use problems. According to Hepworth and colleagues, those criteria include that the intervention: (a) "is supported by empirical research"; (b) "shows less expenditure and more efficiency"; (c) "demonstrates specificity with which procedures are delineated"; (d) "can be used to train persons to transfer knowledge and skill"; (e) "is ethno-culturally sensitive" (f) "is efficacious within community practice"; and (g) supports values of the profession choosing the intervention.

According to the director of the National Center for Substance Abuse Treatment (CSAT, 2008) of the Substance Abuse and Mental Health Services Administration (SAMHSA), the mission of CSAT is to promote excellence among community-based services providing substance abuse treatment. Thus, the second aim is to explore whether CM-PR is compatible with values and guidelines from professional groups that are providers of substance abuse treatment: behavior analysts (Behavior Analysts Certification Board, BACB, 2004); chemical dependency counselors (National Association of Alcohol and Drug Abuse Counselors, NAADAC, 2004); psychiatrists and addictionologists (American Medical Association, AMA, 2001); psychologists (American Psychological Association, APA, 2002); nurses (American Nursing Association, ANA, 2005), and social workers (National Association of Social Workers, NASW, 1999).

CRITERIA FOR CHOOSING AN INTERVENTION

Is CM-PR "Supported by Empirical Research"?

Findings indicate that: Reinforcers contingent on abstinence can change one's preference for substance use if the magnitude is high (Higgins and Petry, 1999; Petry, 2000, 2004); Participants randomized to CM-PR conditions are more likely to initiate and maintain abstinence than those who are randomized to a drug

counseling condition (Peirce et al., 2006; Petry et al., 2000, 2004; Petry, Alessi et al., 2005); and CM-PR is as effective as a CM-V condition, and more effective than substance abuse counseling, the most common type of therapy (Petry et al., 2007).

Are Directions Clear and Concrete?

CM-PR includes clearly explained steps in a comprehensive guide (Petry, 2000) that describes how to: assess a problem and identify a target behavior; develop a contract that includes a goal of changing that behavior; provide positive reinforcement upon demonstration of behavior change; and evaluate treatment effectiveness. Each will be explained below.

Problem assessment and identification of target behavior. According to Hartmann (1984, p.109) target behaviors should “meet one of the following criteria: be important to the client or significant others; be dangerous; be socially repugnant; seriously interfere with client’s functioning; and represent a clear departure from normal functioning.” Depending upon the severity of the problem, substance use may meet all of these criteria.

Clients choose to work on goals from a range of problems in life areas that were affected by their addiction, if the client wants to improve those areas (L. Epstein, 1980). Choosing activities that move clients toward goals is consistent with self-determination and supports Perlman’s argument (1965, p. 418) that the “first step in the process of self-determination” is choosing which problems to pursue and when and how to pursue them.

Contract Development. Developing contracts with clients can be therapeutic, help practitioners complete a functional assessment of substance use behavior, and evaluate CM-PR's efficacy (Greene, 1990; Maluccio & Marlow, 1974). Failure to explain the contract adequately may interfere with the clients' opportunities to earn reinforcement and sabotage treatment (Hanson, 1983, p. 147). All clients, but especially those with cognitive limitations and post-acute withdrawal symptoms, are more likely to complete goals if they are divided into small steps. It is important to identify what forms of proof can be used to verify an activity (walk in the park), and to identify an alternate activity to complete if the client is unable to complete another in order to increase the probability the client will earn reinforcement.

Intervention. Clients in CM-PR drug treatment are often reinforced for abstinence. Typically a client is required to submit a breath sample negative for alcohol before he or she is eligible to receive reinforcement for an abstinent drug sample. The provider must have drug testing supplies on-hand so the sample can be tested immediately after submission and reinforcement earned upon submitting

a negative screen. In CM-PR, the provider must have the prize bowl and a wide variety of prizes available so the client can choose a desired reinforcer immediately from a variety of reinforcers.

According to Hepworth (p. 24), connecting clients to resources is an important function. McLellan and colleagues (McLellan, Arndt, Metzger, Woody, & O'Brien, 1993) found that clients randomly assigned to a group receiving basic methadone services plus on-site medical, family, and employment counseling showed greater reduction of opiate and cocaine use compared to participants receiving methadone maintenance only, or those receiving methadone maintenance plus drug counseling only. In a comparison study of eight treatment sites, McLellan's group (McLellan et al., 1999) found that at 26 months, participants who had received basic drug treatment plus clinical case management and support services (e.g. free parenting classes, emergency bill payment, legal services, and drug-free housing) had better medical, family relations, employment and legal status, and less alcohol use compared to participants who only received 12-step oriented outpatient group counseling.

Evaluation of Treatment Effectiveness. CM-PR treatment typically evaluates attendance and abstinence: weeks in treatment, length of continuous abstinence, number of abstinent samples, and pre- and post-treatment toxicology results (Petry & Stitzer, 2003). In addition to biochemical analyses, the Time-Line Follow Back (TLFB) calendar (Sobell, Maisto, Sobell, and Cooper, 1979) method elicits self-reported use whereby clients trace their substance use backward from the current day, to prior weeks, months, and years. Individuals with substance use problems often have difficulty remembering events that occurred when they were intoxicated or withdrawing, and prompting reminders (holidays, weekends) may be necessary.

Can knowledge and skills be taught?

Training. CM-PR is manual-driven with clear and concise explanations of behavioral principles and techniques (Petry & Stitzer, 2003). Clinicians in the community can learn to implement CM-PR (Petry & Simcic, 2002) but the protocol is complicated and training may take several sessions. Petry first tests the practitioners' understanding of CM-PR concepts, how they collect drug samples, write contracts, and reinforce the participants using the prize system. Often these tasks are evaluated during pretreatment pilot sessions.

Supervision. Because of CM-PR's complexity, regular supervision is needed to insure fidelity of the intervention (Petry & Simcic, 2002). Supervisors can guard against therapeutic drift and use of non-protocol therapies by measuring practitioners' adherence from audiotapes of their sessions. The Yale Adherence

and Competence Scale (Carroll, Nich, & Rounsaville, 1998; Carroll et al., 2000) explains how to monitor whether the practitioner: 1) reviewed last week's activities; 2) helped the client write a contract for next week; and 3) helped the participant choose prizes for abstinence and completion of activities.

Is the intervention ethno-culturally sensitive and appropriate?

As cautioned by Hepworth and colleagues (2006, p. 20), an intervention must promote justice with disadvantaged and vulnerable populations. CM-PR has been implemented in a variety of studies which included participants of different ethnic groups. Neither ethnic nor racial differences have had an effect on abstinence (Reiber, Ramirez, Parent, & Rawson, 2002) or goal attainment (Lewis & Petry, 2005).

Are techniques efficacious within community practice?

Community practitioners who treat persons with substance use problems provide social reinforcement and often referrals to concrete services. Case management with referrals to concrete services plus standard drug counseling predicts better long term abstinence and improved medical, family, legal, and employment status than treatment without case management (McLellan et al., 1999).

Is intervention appropriate to the profession?

Values guiding work with individuals are similar across professional organizations that provide substance abuse treatment and are included in their Codes of Ethics as necessary for professional conduct: (a) service; (b) social justice; (c) dignity and worth of persons; (d) importance of human relationships; (e) integrity; (f) competence; and (g) ethical treatment of vulnerable populations. Examples of how CM-PR adheres to these values are discussed. A statement from each of these professional organizations' Codes of Ethics is given as an example of their guidelines. (See Table 1).

Service. CM-PR's goal is to help the individual reduce substance use problems. The physical, mental, and social problems associated with abuse and dependence (American Psychiatric Association, APA, 1994) are often ameliorated by CM-PR's interventions (Lewis & Petry, 2005; Higgins & Petry, 1999; Petry et al., 2006; Petry, Martin, & Simcic, 2005). [(BACB: Guideline 2.00); (NAADAC: Principle 2); (AMA: Preamble); (APA: Principle A); (ANA: Provision 2.1); (NASW: Preamble)].

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TABLE 1. COMPARISON OF CM-PR TO ETHICAL GUIDELINES

Values	Contingency Management-Prize Reinforcement	Ethical Guidelines
Service	Alleviation of substance use problems affecting individuals and their families.	BACB: 2.00. "...(R)esponsibility to operate in the best interest of clients." NAADAC: 2: "...(P)rofessional responsibility and loyalty is welfare of my clients." AMA: Preamble:...(E)thical statements developed primarily for benefit of the patient. APA: A: "...(B)enefit those with whom they work and take care to do not harm." ANA: 2.1: "...(P)rimary commitment is to the recipient of nursing and health care." NASW: Preamble:"...(E)nhance human well-being and help meet basic human needs."
Social Justice	The cost of CM-PR is substantial, but lower than the societal costs of drug-related crime.	BACB: 10.0: "...(P)romotes the general welfare of society." NAADAC: 5: "...(I) reserve) the right to commit civil disobedience." AMA: 3: "... (S)eek changes in requirements contrary to best interest of the patient." APA: E. "...(S)afeguards may be necessary to protect the rights and welfare..." ANA: 9.4: "...(W)ork as citizens or collectively to bring about social change." NASW: 6.04: "...(A)dvocate for changes to improve social conditions."
Dignity and Worth of Person	CM-PR has treated persons with addictions, AIDS, and other stigmatized disorders	BACB: 3.03: "...(I)nformation-gathering activities regarding influences of behavior." NAADAC: 3: "...(F)undamental human right of all individuals to self-determination." AMA: 2.5: "...(C)ontractual arrangement binds physician as well as on the patient." APA: E: "...(R)ights of individuals to privacy, confidentiality, self-determination." ANA: 1.3: "...(W)orth is not affected by disease, disability, functional status." NASW: 1.05a: "...(R)ecognizing the strengths

		that exist in all cultures."
Importance of human relationships	Both client and practitioner choose goals to pursue and how behaviors will be verified.	BACB: 3.09: "... (B)ehavioral assessment explained in understandable language..." NAADAC: 2: "... (R)espect what client, not I, perceive(s) as good and necessary." AMA: 2.2: "... (N)ot use power to influence patient not directly relevant to treatment." APA: Preamble: "... (H)elp the public develop informed judgments and choices..." ANA: 2.2: "... (R)esolve conflicts to ensure patient safety and best interests." NASW: 1.07a: "... (O)nly solicit private information if essential to providing services."
Integrity	Reinforces the client deems desirable are available as potent incentives for behavior change	BACB: 4.02: "... (A)pply reinforcement rather than punishment whenever possible." NAADAC: 8: "... (R)efrain from using methods that could be considered coercive." AMA: 1.1: "... (B)e vigilant about boundaries of the doctor patient relationship." APA: A: "... (G)uard against factors that might lead to misuse of influence." ANA: 4.1 "... (P)rimarily responsible and individually accountable for patient care." NASW: 1.06a: "... (P)rotecting clients' interests may require referral of the client."
Competence	CM-PR treatment is manualized and supervised to prevent therapeutic drift.	BACB: 4.05: "The behavior analyst modifies the program on the basis of data." NAADAC: 4: "... (R)efuse to accept supposition and prejudice as if it were the truth." AMA: 5.0: "... (C)ontinue to study, apply, and advance scientific knowledge." APA: Preamble: "... (I)ncrease scientific and professional knowledge." ANA: 3.5: "... (T)ake action against incompetent practice placing patient in jeopardy." NASW: 4.01b: "... (E)xamine and keep current with emerging knowledge."
Treatment of Vulnerable Individuals	CM-PR is costly but lower than the societal costs of	BACB: 4.07: "... (R)ecommends the least restrictive procedures." NAADAC: 7: "... (S)upport the development of a

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	drug-related crime.	relationship of equals." AMA: 4.2: "... (R)elease confidential information only with the authorization." APA: E: "... (S)afeguards may be necessary to protect rights and welfare of persons." ANA: 1.4: "... (R)ecognition of specific patient rights, the right of self-determination." NASW: 6.04b: "... (O)pportunity for all: vulnerable, disadvantaged, and oppressed."
Intervention is Efficient and Effective	CM-PR is evidence based and can be modified based on outcomes.	BACB: 2.09: "... (R)ecommend scientifically supported most effective treatment." NAADAC: 4: "... (N)o claims for efficacy not verified by scientific inquiry." AMA: 6.2: "... (R)efuse treatment to a person with no treatable mental illness." APA: D: "... (A)ll persons entitled to equal quality in processes, procedures, services." ANA: 1.3: "... (I)nvolve in research, education, practice, policy development." NASW: 5.02c: "... (C)ritically examine and use research evidence."

Note. BACB = Behavioral Analysis Certification Board, NAADAC = National Association of Alcohol and Drug Abuse Counselors, AMA = American Medical Association, APA = American Psychological Association, ANA = American Nurses Association, NASW, National Association of Social Workers. Ethical guidelines are quotations, but in condensed versions.

Social justice. Critics of CM-PR disagree with behavioral interventions that "pay someone for doing what they should do anyway" (Sindelar, 2008). Sindelar argues that CM-PR is an innovative alternative to the criminal justice approach and views the addict as having a relationship to the drug that is maintained by the environment. This view contrasts with society's view that persons with substance use problems engage in willful misconduct and need to be punished (Petry, 2006; Van Wormer & Davis, 2003, p.58). [(BACB: Guideline 3.03); (NAADAC: Principle 3); (AMA: Section 2.5); (APA: Principle E); (ANA: Provision 1.3); (NASW: Standard 1.05a)].

Dignity and worth of persons. The CM-PR practitioner works closely with the client as an ally to support treatment success. The practitioner helps the client identify the target goals he or she wants to work on. The therapist motivates the client with incentives rather than mandating compliance and punishing failure. The therapist's responsibility is to have prizes and testing supplies available, thus upholding his or her "contract" (Petry, 2000). In addition, guidelines require that

the therapist maintain confidentiality, respect the client's boundaries, and refrain from relationships that exploit the participant. [(BACB: Guideline 3.09); (NAADAC: Principle 2); (AMA: Section 2.2); (APA: Preamble); (ANA: Provision 2.2); (NASW: Standard 1.07a)].

Importance of human relationships. CM-PR's goal is to identify an improvement in a person's drug use behavior and reinforce that new behavior with the opportunity to win prizes that are desirable. The practitioner is a partner with the client and acts as a resource to the client (Petry, 2006). This includes addressing solutions to overcome lack of concrete services and benefits (Karls & Wandrei, 1994, p. 15). [(BACB: Guideline 10.00); (NAADAC: Principle 5); (AMA: Section 3); (APA: Principle E); (ANA: Provision 9.4); (NASW: Standard 6.04)].

Integrity. The practitioner remains an ally to the client and helps the client identify antecedents to behaviors and break down larger problems into manageable goals. This can be a lengthy process (Fischer, 1978) because the practitioner and client must devise a contingency plan with a high probability of success. [(BACB: Guideline 4.02); (NAADAC: Principle 8); (AMA: Section 1.1); (APA: Principle A); (ANA: Provision 4.1); (NASW: Standard 1.06a)].

Competence. Part of CM-PR's appeal is that the methods are concrete. However, a difficulty in applying this model is that the intervention is complicated by a number of steps. An effective way to overcome this drawback is for the supervisor to monitor the therapist's adherence to the treatment manual (Carroll et al., 1998, 2000), and thus protect against therapeutic drift. [(BACB: Guideline 4.05); (NAADAC: Principle 4); (AMA: Section 5.0); (APA: Preamble); (ANA: Provision 3.5); (NASW: Standard 4.01b)].

Treatment of vulnerable individuals. Individuals may put themselves in dangerous situations while procuring, using, or experiencing withdrawal from alcohol or drugs. Helping individuals become abstinent is a critical way to decrease vulnerability. Although L. Epstein (as cited by Hanson, 1983, p. 148) argues that because behavioral interventions are designed to change the client's behavior, he or she may become identified as being "flawed, Schwartz and Goldiamond (1975, p. 270) write that the therapist can have "...respect for the client, and an investment in seeing that the client attains his terminal repertoire..." taking the focus from deficits to strengths [(BACB: Guideline 4.07); (NAADAC: Principle 7); (AMA: Section: 4.2); (APA: Principle E); (ANA: Provision 1.4); (NASW: Standard 6.04b)].

Is intervention more efficient than other equally effective interventions? CM-PR's efficacy depends upon the magnitude of the reinforcer (Petry et al., 2004), the schedule of reinforcer delivery (Roll & Shoptaw, 2006), and in a community

setting, the staff costs (Olmstead, Sindelar, & Petry, 2007; Sindelar, Elbel, & Petry, 2007). Petry and colleagues (2004) found that on average when they applied a CM-PR reinforcer equal to \$80 per 12-weeks, treatment outcomes were similar to outcomes from a drug counseling treatment condition without a reinforcer. However, when the magnitude of the reinforcer was increased to \$240 per 12-weeks, participants submitted significantly more negative samples and remained abstinent for more consecutive weeks compared to either condition. [(BACB: Guideline 2.09); (NAADAC: Principle 4); (AMA: Section 6.2); (APA: Principle D); (ANA: Provision 1.3); (NASW: Standard 5.02c)].

LIMITATIONS TO CM-PR'S APPLICABILITY TO COMMUNITY PRACTICE

Implementing CM-PR may be more expensive than drug counseling, the most common substance abuse treatment, but some of the expense is due to CM-PR's success (Olmstead, Sindelar, & Petry, 2007; Petry et al., 2000; Petry, Alessi et al., 2005). For example Sindelar and colleagues (Sindelar, Elbel et al., 2007; Sindelar, Olmstead et al., 2007) report that higher staff salaries (including fringe benefits) occur with CM-PR because clients remain in treatment longer and create more demand for additional staff hours. Staff oversees several components of a CM-PR condition. Clients typically draw at least one slip of paper for attendance, are tested for alcohol and drugs, and are reinforced with prizes if abstinent. Therapists must verify completion of activities from the previous week and develop a new weekly contract with the client. Thus, because of its staff commitment, implementing the CM-PR protocol may deter some community programs (Petry, 2006).

However, CM-PR costs can be reduced while maintaining improved outcomes by using group therapy (Petry, Martin, & Finocche, 2001; Petry, Martin, & Simcic, 2005) and by donations (Amass & Kamien, 2004). Amass and Kamien (2004) found that the Los Angeles community donated on average \$4,500 each month for 34 months, and the Toronto community donated on average \$4000 each month for 2 months, for reinforcers for programs for pregnant substance abusing women.

APPLICATION OF CM-PR TO COMMUNITY PRACTICE

Institution of a behavior can occur by direct reinforcement, or by reinforcing behaviors that are incompatible with the desired behavior (Mattaini, 1996, p. 30). CM-PR is applicable to community practice where practitioners can provide social reinforcement for completion of targeted behaviors (Corey, 2004, p. 367). CM-PR extends this practice by reinforcing participants with material reinforcers upon completion of non-drug-related activities. In a recent study of goal-related

behaviors, participants who elected to be reinforced for engaging in family activities had improved treatment outcomes and family functioning compared to participants who did not choose to be reinforced for family activities (Lewis & Petry, 2005).

APPLICATION OF CM-PR TO POLICY

Sindelar and colleagues (Olmstead, Sindelar, & Petry, 2007; Sindelar, Elbel et al, 2007; Sindelar, Olmstead et al., 2007) calculated the costs of implementing a CM-PR drug treatment program. They reported that depending upon the total cost of prizes earned, the incremental cost of increasing a stimulant addict's consecutive abstinence by one week ranged from \$114 (Sindelar, Elbel et al., 2007), to \$141 (Sindelar, Olmstead et al., 2007) and to \$258 (Olmstead, Sindelar, & Petry, 2007). While these costs are substantial, they are lower than the average cost per week (\$434.35) of housing an inmate in a state prison (Stephan, 2004), and societal costs of drug-related crime (violent robbery = \$48,095, and non-violent theft = \$1,583) (Olmstead, Sindelar, & Petry, 2007).

CONCLUSION

There is ample empirical support that CM-PR is an efficacious treatment for substance abuse problems that is consistent with Hepworth and colleagues' (2006) criteria for choosing an optimal intervention. CM-PR is a good fit for community-based treatment for individuals with substance use problems because it is based on the most current research-based interventions, as mandated by international and national guidelines. The Policy Statement of the College on Problems of Drug Dependence, Inc. (CPDD), a World Health Organization Collaborating Center (Stitzer, Owen, Hall, Rawson & Petry, 2003), recommends that objective measures of treatment retention and drug abstinence are the best evidence of treatment efficacy. As discussed here, CM-PR meets those recommendations. CM-PR also meets guidelines from national professional organizations of providers of substance abuse treatment: Behavior Analysts Certification Board; National Association of Alcohol and Drug Abuse Counselors; American Medical Association; American Psychological Association; American Nursing Association; and National Association of Social Workers. Because CM-PR is an effective treatment of substance abuse problems it upholds these professional guidelines that include service, social justice, dignity and worth of persons, importance of human relationships, integrity, competence, and treatment of vulnerable populations. In spite of robust outcomes there is little evidence that community programs have implemented CM-PR as a substance abuse treatment method (Petry, 2006). Substance use problems are ubiquitous but whether the

benefit of CM-PR is worth the cost depends upon the value society places on recovery (Mattaini & Moore, 2004, p.66)

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