Contingency Management Interventions: From Research to Practice

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Behavioral interventions have enjoyed widespread use in the treatment of a variety of psychiatric conditions, including autism (1), conduct disorder (2), developmental disorders (3), eating disorders (4), and even schizophrenia (5). These techniques are based upon the principles of rearranging the environment to reinforce appropriate behavioral patterns while providing negative reinforcement for inappropriate behaviors. Similar procedures have been applied to substance-abusing populations, and these interventions have been termed contingency management.

"The other addicts, they see how I've changed, and they don't believe it.... I've become a beautiful person."

In the treatment of substance use disorders, contingency management techniques have demonstrated efficacy in retaining substance-abusing clients in treatment, promoting drug abstinence, and encouraging appropriate behaviors (see reference 6 for review). These treatments are based on three general behavioral principles: 1) frequent monitoring of the target behavior; 2) provision of tangible, positive reinforcers when the target behavior occurs; and 3) removal of the reinforcer when the target behavior does not occur. In a series of elegantly designed clinical trials, Higgins et al. (7–10) demonstrated the efficacy of contingency management in treating cocaine dependence.

Despite their efficacy in specialized research programs, contingency management approaches have been criticized for their cost and putative lack of applicability in community-based settings. In the studies conducted by Higgins and colleagues, for example, clients earned vouchers that were exchangeable for retail goods and services in excess of $1,000. Non-research-based clinics are unlikely to have the funds to support voucher programs, and less expensive contingency management approaches may be necessary for adaptation in community-based settings. Moreover, research studies necessitate use of specific protocols that are strictly enforced across all clients, while clinical practice often employs a more individualized approach toward therapy. When applied in community-based programs, contingency management interventions are likely to be tailored to unique client characteristics and issues.

To illustrate the similarities and divergences of contingency management when applied across settings and clients, we detail here three case reports. We selected cases from three distinct community-based treatment programs that varied along a number of dimensions. The interventions varied with respect to the reinforcers used and the behaviors targeted for reinforcement. Case 1 describes a subject with cocaine-induced psychotic episodes on a regimen of methadone maintenance who participated in a contingency management study that reinforced abstinence from opioids and cocaine by using the chance to win prizes as the reinforcer. Case 2 involves an HIV-positive subject with cocaine dependence and intermittent explosive disorder for whom prize reinforcements were linked to group attendance and the accomplishing of individually tailored goals. Finally, case 3 describes an individual with cocaine dependence and paranoid schizophrenia who was chronically misusing psychiatric emergency room services. A contingency management plan was implemented that provided portions of his disability payments contingent upon drug abstinence, medication compliance, and appropriate use of therapeutic services. These examples illustrate the use of contingency management in sequentially less structured settings and involving less start-up resources for application.

Case 1

Initial Assessment

Ms. A was a 45-year-old Caucasian woman diagnosed with heroin and cocaine dependence, bipolar disorder, antisocial personality disorder, and cocaine-induced psychotic episodes. She had a long history of prostitution and sharing injection equipment. She had contracted HIV 5 years ago and was awarded a psychiatric disability at that time.

Ms. A had been on a regimen of methadone maintenance for about 2 years. Despite dose increases up to 120 mg/day, she continued using heroin at the rate of one to 15 bags per day as well as up to three to four dime bags per day of cocaine. After cessation of a co-

caine run, Ms. A experienced tactile and visual hallucinations characterized by "bugs crawling around in my skin." She mutilated herself during severe episodes and brought in quantities of her skin to show the "bugs" to her therapist.

Ms. A had been hospitalized four times for cocaine-induced psychotic episodes. Following an 11-day stay in an inpatient dual diagnosis program subsequent to another cocaine-induced psychotic episode, Ms. A was referred to our ongoing study of contingency management interventions for methadone-maintained, cocaine-dependent outpatients.

Developmental History

Ms. A had two brothers, both of whom were drug abusers. Alcohol abuse was present in both her parents' families, and she reported physical and sexual abuse since the age of 3. She dropped out of school at age 16 and had her first of two children 1 year later. She has had little contact with her 28- and 13-year-old sons, who are being raised by their fathers.

Ms. A's substance abuse began at age 13, when she started using alcohol and marijuana. Cocaine abuse began in her early 20s, followed shortly by heroin abuse and dependence. Since her mid 20s, Ms. A had used heroin and cocaine intravenously at the rate of 15 bags of heroin and three to four dime bags of cocaine daily. Her drug use resulted in several emergency room visits for drug overdoses, multiple detoxifications, and three previous methadone treatments, as well as numerous psychiatric hospitalizations for suicidality and cocaine-induced psychotic episodes.

Ms. A also had an extensive legal history, including convictions for drug charges, forgery, burglary, prostitution, and parole violations. She reported two incarcerations, one related to prostitution and the other for burglary. She was on probation at the initiation of the contingency management study.

With the exception of HIV, Ms. A's medical history was nonremarkable. She attended an outpatient medical clinic for HIV but was not taking any medications for HIV because she stated that they "mess up my liver." She sporadically attended an outpatient dual diagnosis program, from which she received several medications, including fluoxetine (20 mg b.i.d.), gabapentin (300 mg q.i.d.), and doxepin (75 mg p.r.n.). She reported poor compliance with the medications, especially during periods of heavy drug use. She frequently failed to attend the methadone clinic, missing 11 doses in the 2-month period before her most recent hospitalization. She had not provided a urine specimen negative for both cocaine and opioids before this inpatient stay.

Behaviors to Target

Ms. A's primary problem was her drug use, which was associated with cocaine-induced psychosis and poor compliance with psychiatric medications and with methadone. Because her opioid and cocaine use were intricately linked, it was thought that a contingency management intervention that targeted abstinence from both drugs would improve her functioning. As she was already maintained on a high methadone dose, methadone dose adjustments were not made.

Contingency Management Plan

Following discharge from the psychiatric unit, Ms. A was offered participation in our NIDA-funded study evaluating lower-cost contingency management treatment (e.g., reference 11) for cocaine-abusing methadone patients. As part of participation in this study, Ms. A agreed to submit staff-observed urine samples on 2–3 randomly selected days each week for 12 weeks. She was told that she had a 50% chance of receiving standard methadone treatment plus frequent urine sample testing or standard treatment along with a contingency management intervention. She provided written informed consent, as approved by the university's institutional review board.

Ms. A was randomly assigned to the contingency management condition. In this condition, she earned one draw from a bowl for every urine specimen that she submitted that was clean from cocaine or opioids and four draws for every specimen that was clean from both substances. In addition, for each week of consecutive abstinence from both cocaine and opioids, she earned bonus draws. The first week of consecutive cocaine and opioid abstinence resulted in five bonus draws, the second week resulted in six bonus draws, the third week seven, and so on. In total, Ms. A could earn about 200 draws if she maintained abstinence throughout the 12-week study.

The bowl contained 250 slips of paper. Half of them said "Good job" but did not result in a prize. Other slips stated "small prize" (N=109), "large prize" (N=15), or "jumbo prize" (N=1). Slips were replaced after each drawing so that probabilities remained constant. A lockable prize cabinet was kept onsite in which a variety of small prizes (socks, lipstick, nail polish, bus tokens, $1 gift certificates to McDonald's or Dunkin' Donuts, and food items), large prizes (sweatshirts, Walkmans, watches, and gift certificates to book and record stores), and jumbo prizes (VCRs, televisions, and boom boxes) were kept. When a prize slip was drawn, Ms. A could choose from items available in that category. All prizes were purchased through funds from the research grant.

Clinical Course

Ms. A was excited about joining the research project because she had heard about other clients winning prizes. She submitted a urine sample negative for cocaine and opioids her first week in the program, and she earned four drawings for this achievement. She won a jumbo prize that day and selected a VCR. She was very excited about the prizes, stating, "This is the best program in the world!" Ms. A maintained cocaine and opioid abstinence for 4.5 consecutive weeks, earning bonus drawings weekly.

In week 5, Ms. A experienced a relapse. She reported using three bags of heroin and half of a dime bag of cocaine, and her urine sample was positive for both drugs. Although she admitted to no further drug use, she remained opioid positive for over a week. During this week, she submitted cocaine-free specimens and therefore earned one draw each time. She was remorseful about the relapse and was encouraged to regain abstinence from both opioids and cocaine to reestablish her bonus draws. A week later, she submitted a urine specimen free from both drugs and began earning bonus

draws again. Throughout the rest of the 12 weeks, Ms. A submitted urine samples clean from both drugs.

In total, Ms. A earned 175 draws during treatment. In addition to her one jumbo prize, Ms. A drew 67 small prizes, and she selected gift certificates to Dunkin' Donuts and McDonald's (36 times), socks and hosiery (17 times), food and drink items (nine times), costume jewelry and makeup (four times), and bubble bath (one time). She also won 12 large prizes and selected a watch, a Walkman, a camera, a purse, a travel bag, a curling iron, a jogging suit, a collectible box, two pot and pan sets, mixing bowls, and flatware. In total, these prizes were purchased for $309.

During the study, Ms. A never missed a day of methadone treatment, regularly attended group sessions, and honored all her individual counseling sessions at the clinic. She was compliant with her psychiatry appointments and medications and experienced no psychotic episodes during the program. Ms. A expressed enthusiasm for the project and encouraged other clients to join the study. She was pleased with the prizes and stated, "Having good stuff in my apartment and new clothes makes me feel better about myself. When I feel good about me, I don't want to use cocaine."

At 6-month follow-up, Ms. A had experienced only one drug use lapse. She self-reported use of two bags of heroin and half of a dime bag of cocaine about 3 months after the contingency management treatment ended. Her urine sample results confirmed drug use at that time, but her other clinic samples were drug-free. She began volunteering at a local shelter and was taken off of probation. On a Quality of Life Inventory (12), Ms. A's scores increased from –2.2 at intake to the contingency management study to –0.83 and –0.45 during treatment; they rose to 1.46 posttreatment. At the time of this report, she had missed only 1 day of methadone treatment in over 6 months and was being considered for take-home privileges.

Review and Comments

This contingency management intervention led to a variety of beneficial effects that extended beyond reducing opioid and cocaine use. The subject became more compliant with methadone and psychiatric medications, and her quality of life improved on a variety of dimensions.

Nevertheless, the two lapses to drug use are a cause for concern. Although this subject was able to reinstate abstinence, standard treatment does not provide frequent drug monitoring or tangible reinforcement for abstinence. Sporadic drug use without the benefits of the contingency management program may result in a relapse, especially if one becomes noncompliant with psychiatric medications.

Because this subject was enrolled in a research study, extension of the contingency management plan beyond 3 months was not possible. She may have benefited from an individualized approach targeting other problem behaviors, such as frequent monitoring and reinforcement for compliance with psychiatric medications. When abstinent from drugs, she may be able to tolerate medications for HIV. A contingency management plan reinforcing compliance with HIV medication (13) may have further improved outcomes.

Case 2

Initial Assessment

Mr. B was a 35-year-old, divorced African American man with alcohol and cocaine dependence and intermittent explosive disorder. He was diagnosed with HIV in 1991.

Since 1996, Mr. B had attended an HIV community drop-in program about three to four times per week for meals, clothing, and recreational activities. During his visits to the clinic, he would engage in heated arguments with other clients and staff. These arguments occurred on a weekly or more frequent basis. He would often appear at the clinic intoxicated as well. On numerous occasions, Mr. B was formally written up by the program's director for arguments, intoxication, drug dealing, and fraud. For these offenses, he had been asked to leave the clinic several times, once for an entire year.

Despite the fact that his drug use and impulsive behaviors resulted in a variety of medical, legal, social, and employment problems, Mr. B had never received any psychiatric or substance abuse treatment. Individual case management sessions, groups focusing on medication compliance, and individual and group substance abuse treatment were all offered free of charge onsite at the HIV drop-in program, but Mr. B had never attended any of these programs. He likewise refused to receive any treatment offsite, with the exception of occasional medical visits for HIV. He was noncompliant with HIV medication at the onset of the contingency management demonstration project.

Developmental History

Mr. B had three brothers, all of whom had drug and alcohol problems and two of whom had been diagnosed with intermittent explosive disorder. Both his mother and his father had problems with alcohol, although he did not report any other psychiatric problems in his family of origin. He came in for psychiatric treatment twice in his lifetime for "severe anger management problems," but he never returned following the intake evaluations.

Mr. B had five children with four different women. The children ranged in age from 8 to 21 years; all were being raised by their mothers. Mr. B reported on-and-off relationships with his children that were marred by frequent conflicts with them and their mothers.

Mr. B began abusing alcohol and marijuana at age 18 and cocaine at age 26. He had never received substance abuse treatment, and he reported no periods of abstinence except during brief incarcerations. Mr. B was arrested on drug charges twice, once serving 3 months in jail.

Mr. B worked as a carpenter but lost several jobs because of his "attitude." In the past 5 years, he had not been able to hold down a part-time job for more than a month or two at a time. Because of financial difficulties, he had no stable housing arrangements and was "living with friends" at the time of implementation of the contingency management demonstration project.

Behaviors to Target

Mr. B represented one of many substance abusers who do not come in for formal treatment. Despite his lack of involvement in treatment, his frequent attendance at

this drop-in program indicated that Mr. B was willing to engage on some level, if only for food and social interactions. Although he had multiple problems ranging from anger management to drug abuse, limited medical treatment for HIV, and housing and unemployment difficulties, these issues could not all be solved at once. Contingency management interventions work best when discrete behaviors are targeted (14). It was felt that a contingency management plan that targeted simple behaviors (such as attendance) would assist in engaging this client in treatment and reducing some of his psychosocial problems.

Contingency Management Plan

This contingency management demonstration project was designed to enhance attendance at the substance abuse treatment groups held onsite on Tuesdays and Thursdays and to improve psychosocial functioning of clients. The groups focused on developing weekly action plans to accomplish individually tailored goals. For example, if a goal was sobriety, the client might agree to attend two Alcoholics Anonymous meetings in the upcoming week, find a sponsor at a meeting, or enroll in an offsite substance abuse treatment program. If a goal was to obtain employment, the client might agree to write a resume or complete three job applications in the upcoming week. If a goal was to improve health, the client might agree to attend a medical appointment or to record the dates and times of medication consumed. Each week, clients selected two specific activities related to their treatment goals, and they reported back on their progress the subsequent week. Any client who was a member of the drop-in clinic could attend the groups. Membership at the clinic was free and open to anyone HIV positive. Over 90% of members of the clinic were drug dependent.

The first 6 weeks served as a baseline period, during which attendance at groups and compliance with activities were recorded, but no reinforcers were provided. In weeks 7–18, the reinforcers were instituted, first in Tuesday groups (weeks 7–12) and then in Thursday groups (weeks 13–18). The structure and content of the incentive and nonincentive groups were identical, with the exception that in the incentive groups, clients earned draws from a prize bowl for the number of consecutive weeks that they attended group. They earned additional draws for completing weekly activities. If objective verification (e.g., receipts) of completion of an activity was brought to group (see reference 15 for description of activities and verifications), clients earned one additional drawing. If they successfully completed and verified both of their activities in a given week, they earned bonus draws that escalated with the number of weeks that they completed both activities. The probabilities of winning prizes, and the types of prizes available, were similar to those described in case 1. The only difference was that prizes were solicited from donations whenever possible as well as purchased by a research grant.

In weeks 19–24, the magnitude of the reinforcement was decreased, such that each client earned just one draw from the prize bowl for attendance on Thursdays only. For each activity they completed, their name went into a second urn. One person's name was drawn from that second urn at the end of the session, and that individual received 10 draws from the prize bowl described earlier. In this way, the number of total draws per week (by all clients) was decreased from an average of 50 in weeks 7–18 to an average of 21 in weeks 19–24. From week 25 on, a return to baseline conditions occurred, with no drawings or prizes in either the Tuesday or the Thursday groups.

Clinical Course

During the baseline period, Mr. B was often in the recreation room of the clinic when the substance abuse groups met. He was invited to join, but he always refused, calling them "for idiots." He first attended group during the third week of incentives, because "I saw people come out with good stuff, and I wanted to get some of them free prizes."

During weeks 10–12, Mr. B came to groups weekly, but only on incentive days—Tuesdays. When the incentive day switched to Thursdays in weeks 13–15, he came only on Thursdays. Beginning in week 16, however, a marked change in his behavior and attitude occurred. Mr. B began attending both incentive and nonincentive groups. When incentives were removed in week 25, he continued participating in groups twice weekly. He missed only three sessions in a 4-month period, calling in advance each time to inform the counselor why he was unable to attend.

During his first week in the group, Mr. B identified two goal areas: to get a part-time job and "work on my attitude." He failed to get information from a temporary work agency, but he did meet individually with a counselor to discuss his problems with anger management. In his second week, he set these same activities again and successfully accomplished both of them. In his third week, he began applying for jobs and identified finding sober housing as a new goal area; he filed paperwork for disability housing that week. In his fourth week, he identified clearing up legal problems as another goal area, and he attended his court appointment. During the next several months, Mr. B continued applying for jobs and eventually obtained a position. He located an apartment in which he still resides. He cleared up legal and financial documents related to disability, filed income taxes, and became active in Narcotics Anonymous. He also enrolled in the center's mentor program, where he meets weekly with a peer to discuss drug use and HIV. He reestablished relationships with his children, including attending family therapy with one of his daughters.

Working on his attitude remained a major area of focus throughout Mr. B's participation in the groups. He set specific activities, such as attending weekly individual sessions with a counselor, completing anger management worksheets and diaries, smiling and saying "hello" to people at the center, and refraining from arguments. He also began volunteering at the center; he cooked, signed up for clean-up duty, and created posters and floats for community events. Since joining the groups, Mr. B has not once been reprimanded or asked to leave the center.

Beginning his second month in treatment, Mr. B identified improving his health as another major goal area. He scheduled and attended medical appointments and was reinstated on a regimen of HIV medications (indinavir sulfate, lamivudine/zidovudine, and ritonavir) and reported full compliance for the first time. For some of his activities, he also met with a nutritionist and a physi-

cian to initiate new eating and exercise regimens. Although he reported a poor appetite, he agreed to eat a full lunch at the center daily as one of his activities. He stated, "Once I got the virus, I didn't care about nothing. Nothing! Now, I'm trying to be healthy and to take care of myself. My doctor is really happy with me. He can't believe how I've changed."

Throughout this demonstration project, Mr. B earned 126 draws from the prize bowl for attendance and activity completion. These draws resulted in 60 small prizes, seven large prizes, and one jumbo prize. Even though no drawings had been available for the preceding 2 months, Mr. B continued participating in group and individual sessions. Although urine sample testing was not conducted at this clinic, Mr. B did not once appear at the clinic intoxicated since attending groups. He admitted to regular use of alcohol and marijuana but reported no cocaine use in the past 4 months.

Mr. B has become a strong proponent of the program, frequently encouraging other clients to attend. He stated, "This program is not just about talking about using and not using. It's different. It's about changing your life. This program changed me really a lot. I used to have a really shitty attitude, defensive, hostile, angry. I'd come in drunk or high. Now, I did a 180-degree turn. I'm responsible now. The other addicts, they see how I've changed, and they don't believe it. They knew me when I used to fight when anybody just looked at me wrong. They don't want to be me, but some of them, they want to be like me. I've become a beautiful person."

Review and Comments

The use of contingent reinforcement for attendance at group seemed to be an ideal approach for engaging this client in treatment for the first time. The subject admitted that his initial interest in attending the groups was simply for materialistic gain. However, after attending several sessions, the focus shifted from external reinforcement to a combination of external and internal motivations to engage in treatment, as evidenced by his attendance on nonincentive days and his continued participation and completion of goal-related activities even after all material incentives were discontinued. The new behavior patterns seemed to become self-reinforcing; he enjoyed the social reinforcement he received from other addicts, who commented on his change in attitude. His improved relationships with his children also seemed to encourage his less hostile attitude. The support he received from his physician in conjunction with new eating and exercise regimens reinforced his healthier lifestyle as well.

In part because of its unique setting (a drop-in clinic), this project utilized a very individualized and nonjudgmental approach toward substance abuse treatment. Clients could decide upon specific problem areas on which they focused their efforts. Thus, drug abstinence was encouraged but not mandated as a goal area. Had this clinic agreed to conduct urine testing, this subject may have benefited further from contingent reinforcement for drug abstinence. Although his self-reports of cocaine abstinence may have been suspect, he did not appear at the clinic intoxicated since he had become involved in the contingency management project.

Case 3

Initial Assessment

Mr. C was a 47-year-old, single Caucasian male veteran diagnosed with chronic paranoid schizophrenia, cocaine dependence, polysubstance dependence, and antisocial personality disorder. He received a veteran's pension of $1,196/month and $750/month in Social Security Disability Insurance. Mr. C had a conservator for his personal and financial affairs. He had been unemployed since his discharge from the service in 1975, and he intermittently earned money for drugs as a "gypsy" cab driver, ferrying sellers and buyers to make their deals.

Lack of housing was a chronic problem. For much of his adult life, Mr. C had lived on the streets or slept in the back of his cab. Efforts by the dual diagnosis team to place him in rest homes, shelters, and hotels were thwarted because of a reluctance of staff at these facilities to accept Mr. C. This reluctance was due to his antisocial and drug use behaviors and because he would leave abruptly without payment. In response to his chaotic environment, Mr. C developed a pattern of frequenting the psychiatric emergency room asking for food and a bed. He would come in intoxicated and often would call ahead to notify staff that he would be coming in for food and shelter. When refused, he would threaten suicide. For several months, this scenario was repeated up to 15 times per month.

In the fall of 1999, Mr. C again appeared at the psychiatric emergency room. On this occasion, he was intoxicated, carrying razor blades, complaining of auditory hallucinations, and threatening to kill himself if not provided shelter. Mr. C was admitted to the inpatient psychiatric unit for stabilization and safety. A plan was developed to address his worsening problems and chronic misuse of the psychiatric emergency room.

Developmental History

Mr. C had no substance abuse or psychiatric problems in his family of origin. He reported sexual abuse by his father until age 8 and stated that his mother had his father arrested when she discovered the abuse. Mr. C never married and frequents prostitutes.

Mr. C was in the army for 3 years in the 1970s. He was stationed in Germany when he suffered a "psychotic break," during which he "ran around naked." He was hospitalized first in Germany and then transferred to the United States. After a course of hospitalizations, he was released from the service with an honorable discharge and awarded 100% service-connected disability in 1975.

Mr. C's initial drug use began at the age of 16 with marijuana and LSD. He later began to use cocaine and alcohol. He used combinations of these drugs beginning in his late teenage years through his early 30s. In 1983, he was assigned a conservator for his financial affairs because he was spending about $600 weekly on crack cocaine. His longest period of sobriety occurred while incarcerated or hospitalized on a psychiatric ward. Mr. C had been enrolled in a series of drug rehabilitation, work therapy, and community rehabilitation programs, but he had never completed any successfully. He also had undergone 40–50 psychiatric hospitalizations secondary to drug-induced psychiatric decompensation and poor compliance with antipsychotics.

Mr. C had a long history of impulsive and violent behavior, including threatening his clinicians and other patients. He was jailed for 8 months a few years earlier for assaulting his clinician while an inpatient. At the time of implementation of the contingency management program, he was transferred to a new clinician after threatening to kill his previous one, and he was serving a 1-year probation for assaulting an elderly patient during a recent hospitalization.

Behaviors to Target

We noted that Mr. C's misuse of the psychiatric emergency room gradually developed over time, resulting from the reinforcement he received for his inappropriate behaviors. Each time he threatened suicide, he was provided food and a place to stay.

Mr. C exhibited a variety of inappropriate behaviors that were not only detrimental to him but also to the functioning of the psychiatric emergency room. The most crucial problem behaviors seemed to be cocaine use, lack of appropriate housing and subsequent crisis-related psychiatric emergency room visits, nonattendance at therapy, and poor compliance with antipsychotic medications. Because no research grant was available to provide funds for reinforcers, an individually tailored plan using no-cost reinforcers was created.

Contingency Management Plan

A plan was developed to reinforce appropriate behaviors along each of the aforementioned four domains by using cash from Mr. C's entitlements as the reinforcer. As part of this plan, the conservator paid Mr. C's rent directly to a local motel and provided Mr. C with $30 per day for food and clothing. These monies were provided noncontingently. To receive the remainder of his monies, Mr. C was required to 1) provide drug-free urine specimens twice per week at the psychiatric emergency room; 2) stay at the motel and not show up at the psychiatric emergency room at any time other than to provide the scheduled urine samples; 3) meet with his clinician on Friday mornings; and 4) receive his monthly haloperidol decanoate injection at the scheduled times on Friday mornings.

Clean urine toxicology screens were reinforced at the rate of $15 each, and Friday meetings with the clinician and not appearing in the psychiatric emergency room for room and board during the week resulted in $25. Accepting the monthly haloperidol injection was reinforced at $30. Thus, most weeks, Mr. C could earn up to $55 and $85 for the week he was scheduled for the haloperidol injection. On Fridays, the clinician called the conservator and reported the conditions of the contingency management contract that Mr. C met. The amount he earned was disbursed from his funds on Mondays.

Clinical Course

The contingency management intervention was instituted on the day of Mr. C's discharge from the inpatient unit. Mr. C was eager to initiate the contingency management plan upon his discharge. He stated, "I'm sick and tired of fighting with [the conservator] about my money. I need it when I need it. If this is what I got to do to get my money, I'll do it." In the first week, Mr. C honored his first appointment and under supervision produced a clean urine sample. This was a landmark event, since it was the first drug-free urine specimen Mr. C had produced in years outside of a controlled environment. That Friday morning he also received his haloperidol decanoate injection. Mr. C met all four conditions of the contingency management plan his first week. He was congratulated and encouraged to maintain sobriety and remain housed at the motel.

For the first 8 weeks, Mr. C honored his appointments, provided clean urine specimens, took his haloperidol decanoate injection, and did not visit the psychiatric emergency room intoxicated or demanding food and shelter. However, he began complaining of anxiety and requested lorazepam. Because lorazepam was a drug he had previously misused, his olanzapine dose was adjusted instead. Rather than receiving an oral dose of 15 mg at bedtime, he was switched to a regimen in which he received an oral dose of 5 mg every morning and an oral dose of 10 mg at bedtime. This dose adjustment alleviated his anxiety symptoms, and Mr. C made no further requests for lorazepam.

At this time, the dual diagnosis team decided to add an additional reinforcer to Mr. C's contingency management plan: if he could follow the plan for a total of 3 months he would receive an unspecified cash bonus. Mr. C succeeded in maintaining 12 weeks of continuous sobriety. He was congratulated for this remarkable achievement and given a $100 bonus the following Monday. In addition, his conservator gave him $100 extra to purchase Christmas gifts for his family. The team also informed him that if he could remain drug free for another 3 months, he would get another bonus—double the amount given for the first bonus. Mr. C agreed to strive for this abstinence goal.

For 4 months from the initiation of the contingency management plan, Mr. C gave drug-free urine samples, made scheduled visits to his therapist, complied with medications, and remained housed at the motel. With time, his overall grooming and hygiene improved, followed by a marked improvement in mood and cognition. Mr. C demonstrated several instances of good judgment as he resisted temptations to use drugs. He opened a savings account with the money he was earning from the contingency management plan. He was very cooperative, looking forward to individual therapy, in which he often discussed his family. He planned to reestablish contact with them.

Until the institution of this plan, Mr. C's mother had maintained little communication with him and reported difficulty relating to him because of his antisocial behavior. During his period of sobriety, they reestablished contact, and Mr. C spent the holidays with his mother and sister for the first time in many years. He gave them both gifts, a gesture he rarely had made in the past. He reported developing a good relationship with his family and stated, "This is the first time I can give them anything good for Christmas."

After 17 weeks of continuous sobriety, Mr. C relapsed to drug use. The precipitating events related to this relapse are unknown. He was able to achieve an additional 6 weeks of cocaine abstinence about 2 months later but then relapsed again. Although he is abusing cocaine, Mr. C continues to honor his clinic appointments, take his monthly haloperidol decanoate injection, and reside at the motel. He maintains enthusiasm for the contingency

management plan, even though he is not earning all his money. As yet, he has not appeared unexpectedly at the psychiatric emergency room or engaged in violent behavior toward staff. Efforts are continuing to reengage him in sober treatment again.

Review and Comments

This contingency management plan had long-term efficacy for encouraging therapy attendance, enhancing compliance with antipsychotics, and reducing crisis-related psychiatric emergency room visits. It is notable that the subject has not been hospitalized in over a year since the onset of this contingency management plan.

This contingency management approach had partial efficacy in reducing drug use. Since the plan was initiated immediately after the subject left the inpatient unit, while he was drug free, the reinforcers seemingly were sufficient enough to maintain abstinence. Unfortunately, this contingency management plan was unsuccessful in maintaining long continuous periods of abstinence. Perhaps larger magnitude reinforcers were necessary for changing drug use behaviors. While he received $210 per week noncontingently, clean urine samples only provided $30/week. While $25/week and $30/month may be sufficient to reinforce appropriate use of the psychiatric emergency room and medication compliance, reinstating cocaine abstinence following a relapse may require a reinforcer of larger magnitude (16, 17). Nevertheless, the subject's drug-related problems remain considerably lower than in pre-contingency-management periods.

Discussion

These cases illustrate the impact of contingency management procedures on clients participating in a randomized trial, a demonstration project, and an individually designed intervention. The cases were selected from three distinct settings, targeted different types of behaviors, and employed reinforcers ranging from $0 to $300 in additional programmatic costs. These cases should not be interpreted as evidence of the efficacy of contingency management, since they are simply examples of clients who responded favorably toward these procedures. Instead, the focus of this discussion is related to the application of contingency management procedures in clinical practice, using these cases as examples.

These three cases share some similarities. The clients were all chronic substance abusers who were resistant to attending or had difficulty succeeding in standard treatment. They all had some degree of co-occurring psychiatric illnesses, ranging in severity from intermittent explosive disorder, bipolar disorder, and cocaine-induced psychotic episodes to paranoid schizophrenia. Their drug use and psychiatric illnesses resulted in a variety of health and psychosocial difficulties including unemployment, legal problems, and repeated hospitalizations.

The three contingency management interventions reinforced different target behaviors: cocaine and opioid abstinence (case 1), attendance at group and compliance with goal-related activities (case 2), and appropriate clinic attendance (and nonattendance), cocaine abstinence, and medication compliance (case 3). In each case, increases in the target behaviors were noted during implementation of the contingency management plan compared to the noncontingent conditions.

A common criticism of contingency management procedures is that their effects may dissipate when the reinforcer is removed. In two of these cases, continued beneficial effects were demonstrated even after discontinuation of the contrived reinforcer. The subject in case 1 maintained gains in terms of drug abstinence as well as overall quality of life throughout a 6-month follow-up period, and the subject in case 2 attended groups that were not linked to reinforcement both during and after the reinforcement phases. The ultimate goal of contingency management interventions is for the target behavior to eventually become self-reinforcing. In the first case, abstinence may be reinforced through take-home methadone privileges and an improved quality of life. The change in attitude, family relationships, and health behaviors of the subject in case 2 may support continued cocaine abstinence and pro-social behaviors. Although the subject in the third case continued abusing cocaine, stable housing arrangements may prevent further crisis-related psychiatric emergency room visits. It is important to note that contingent disbursement of disability payments can continue indefinitely. While these three cases do not provide evidence of the long-term efficacy of contingency management, they do suggest some potentially enduring effects and methods by which some behaviors may be reinforced long-term.

Because drug abuse is a chronic relapsing condition, complete abstinence may be an unrealistic goal, especially in difficult dual-diagnoses cases. A retrospective analysis of predictors of long-term abstinence in cocaine-dependent patients receiving both contingency management and noncontingency management treatments finds that duration of continuous abstinence is the best indicator of long-term outcome (18). Some clients are able to achieve long periods of abstinence through 12-step and standard treatment approaches. These patients may not benefit substantially from the addition of contingency management. A significant proportion of substance abusers, however, never come in for treatment, and among those who do enter treatment, attrition rates are very high (19–21). A primary benefit of positive-incentive contingency management approaches is that they increase the percent of patients who respond favorably to treatment. These cases are illustrations of individuals who did not engage in or significantly benefit from standard therapy. When the contingency management plans were initiated, their progress dramatically improved.

It is important to note that in these three individuals, improvements were not confined to the target behaviors but rather seemed to extend to other areas of functioning as well. Reductions in cocaine and opioid use for the first subject were associated with increased compliance with psychiatric medications, reductions in psychiatric hospi-

talizations, and improvements in quality of life. The second subject's initial goals of obtaining employment and improving his attitude expanded over the course of treatment to reestablishing contact with his children and improving his health, including complying with HIV medication. Likewise, cocaine abstinence resulted in overall improvement of grooming, cognition, and family relationships. In randomly selected and larger samples, controlled studies may evaluate the efficacy of contingency management procedures in engendering these and other beneficial effects.

These cases illustrate the use of two different types of reinforcers. In studies of contingency management interventions, a variety of other reinforcers have been utilized, ranging from dose changes (22) and take-home privileges (23) in methadone programs to cash (24) and voucher (9) incentives. The prize approach used in cases 1 and 2 was developed to decrease the cost of reinforcement relative to the voucher system (11). The use of contingent disbursement of disability payments is a novel, *no-cost* reinforcement approach (25–27). Reinforcement is provided in traditional substance abuse treatment programs as well. Examples include social recognition and sponsor status in 12-step treatments and take-home privileges, early dosing windows, or dose adjustments in methadone programs. Future research may assess whether utilization of behavioral principles when administering these and other reinforcers improves efficacy in altering problematic behaviors.

What may be more important than the reinforcer provided is the manner in which contingencies are applied. Reinforcers must be applied consistently and immediately to be efficacious in changing behaviors (see references 6, 14). In cases 1 and 2, drawings and prizes were available as soon as the urine sample was tested or the client walked into the session. The contingency management plan for the third subject required a close working relationship with the conservator. It presented reinforcers only on Mondays to decrease the likelihood that the subject would spend his allocation on drugs during weekends. Providing reinforcement in greater temporal proximity to the target behavior (e.g., on the day a negative urine sample is provided) or reinforcing gradual approximations (e.g., quantitative reductions in cocaine metabolites) may have helped to reinstate abstinence (16, 28, 29).

The use of escalating reinforcers for continuous behavioral change also has been shown to be important in promoting continuous abstinence in some controlled studies (30). The contingency management plans in cases 1 and 2 included escalating reinforcers for continuous abstinence or attendance and activity completion. Although the third subject received a bonus for a 3-month period of abstinence, successive increases in the magnitude of reward for each negative sample submitted may have engendered a longer period of abstinence. However, the procedures used did have a major and long-term impact on misuse of the psychiatric emergency room, the behavior of greatest concern in this case.

As more and more clinicians and researchers apply contingency management procedures to treat substance abusing patients, new developments and refinement in the techniques may emerge. We may discover less expensive yet efficacious reinforcers, determine the best behaviors to target, and evaluate the time course and optimal duration of interventions. Case examples such as these do not provide evidence of efficacy of the procedure, but they may demonstrate real-world application of the techniques.

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Supported by NIH grants DA-12056, DA-13444, DA-05626, DA-09241, DA-09250, DA-04060, AA-03510, DA-0454, and RR-06192.

The authors thank the staffs of the Community Substance Abuse Center, The Living Center, and the West Haven VA Department of Psychiatry for assisting in patient care.

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