

RESEARCH SUMMARY BRIEF

CONTINGENCY MANAGEMENT FOR THE TREATMENT OF OPIOID USE DISORDERS

The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5TR) describes opioid use disorder (OUD) as a condition characterized by compulsive and prolonged misuse of illicit or prescription opioids (American Psychiatric Association [APA], 2022). The opioid drug class includes prescription pain medications with addiction potential, such as oxycodone and morphine, as well as pharmaceutical fentanyl, illegally made fentanyl, and the illegal drug heroin (Centers for Disease Control and Prevention [CDC], 2024). Opioids are linked with the highest rates of overdose deaths (Ahmad et al., 2024). The reported number of deaths from opioids in the U.S. increased from 28,986 in January 2015 to 79,642 in November 2023, while in Ohio, overdose deaths due to opioids increased from 2,335 in April 2015 to 3,898 in November 2023 (Ahmad et al., 2024). In 2022, fentanyl or its analogs were reported to be involved in 81% of unintentional drug overdose deaths and 96% of opioid-related overdose deaths in Ohio (Ohio Department of Health, 2022).

Contingency Management (CM) is a behavioral treatment model rooted in operant conditioning, aiming to modify behavior through positive reinforcement (Higgins & Petry, 1999). Initially popularized in the 1980s and 1990s, it was primarily used to address alcohol and cocaine dependence. Examples of CM reinforcement approaches include voucher-based rewards, prize-based rewards, and rewards in the form of various privileges that are valuable to the client (e.g., medication- or treatment-related). This brief outlines findings from a review of the research literature focused on the effectiveness and utility of CM for treating OUD.

Contingency Management Components

A fundamental principle of CM is providing immediate rewards for meeting target treatment goals that support and reinforce a drug-free lifestyle (Michigan Department of Health and Human Services [MDHHS], 2024). Most CM-based interventions emphasize positive reinforcement to incentivize clients to adopt new behaviors and habits, although some programs respond to missed behavioral targets by building in a negative reinforcement component, such as a “reset” or loss of incentive value or quantity or other privileges. Programs are encouraged to identify and focus on observable and measurable behaviors to reward on a predetermined and consistent basis (Petry & Stitzer, 2002). For example, to promote drug abstinence, a program might collect urine drug tests (UDTs) multiple times each week and reward clients for each negative sample. A program that also uses negative reinforcement might incorporate a predetermined negative consequence, such as a reset to the incentive amount or type for each missed or positive UDT.

When using voucher-based incentives, CM programs reward clients with vouchers of monetary value for

achieving desired behaviors (Budney & Higgins, 1998). In a prize-based CM program, clients may earn prizes or chances to enter drawings to win prizes for achieving pre-specified goals (Petry & Stitzer, 2002). Medication-related incentives might take the form of take-home doses or flexible medication schedules, while treatment-related privileges could include allowing clients to modify their counseling schedules or reduce how many sessions clients are required to complete during the program (Chopra et al., 2009; Neufeld et al., 2008).

Literature Review Methods

In 2023, a literature review was conducted to investigate the impact of CM on opioid use and related outcomes. The literature review included searching multiple research databases: APA PsycInfo, CINAHL, MEDLINE, Psychology and Behavioral Sciences Collection, SocINDEX, and the Cochrane Library. Forty-one articles met eligibility criteria for a full review. All 41 studies used experimental study designs¹ and nine studies included follow-up assessments. Most of the studies were conducted in the U.S. (n=37), while two were conducted in China, one in Israel, and one in the United Kingdom. Fidelity was

¹ participants randomly assigned to either CM or another form of treatment, or to no treatment

not frequently explored in the reviewed studies- only one study actively monitored fidelity. One other study reported on strategies used to enhance fidelity to CM. Fifteen studies included participants from vulnerable populations such as pregnant women, sex workers, individuals with HIV or antisocial personality disorder, veterans, individuals with mental illness, unemployed individuals, and individuals engaging in risky behaviors such as syringe sharing. Table 1 outlines other characteristics of the reviewed studies.

Table 1. Description of Reviewed Contingency Management Studies (Total n=41)

Reinforcement/ Incentive type	Voucher-based (n=31) Prize-based (n=5) Medication or treatment-related incentives (n=8)
Outcomes	Drug use (n=41) Treatment retention (n=33) Mortality/morbidity (n=7) Craving (n=2)

Findings

In this review, CM was often delivered in combination with another form of treatment. For example, nearly all of the studies (n=38) enrolled participants who were receiving medication-assisted treatment (MAT). Findings suggested that CM had some promise as a treatment approach for OUD, but primarily during the intervention period, since effects often diminished in the post-intervention stage. While no clear themes regarding CM best practices emerged, the review revealed a wide range of possible CM implementation strategies, including different types of incentives, reinforcement schedules, and target behaviors.

Drug Use: Opioid and cocaine use were the most frequently reported drug use outcomes. Studies often used UDTs as an objective measure of opioid use and many studies examined polydrug or concurrent substance use. Some studies used self-reports of drug use in addition to testing urine drug samples. Most (n=16) studies incentivized abstinence, but treatment attendance, compliance with opioid treatment medication, and job performance were other targeted behaviors. Of the studies that focused on abstinence, 14 incentivized abstinence from multiple drugs while two only incentivized abstinence from opioids. Seventeen studies found that CM had a positive effect

on drug use behaviors, with positive outcomes defined as increased abstinence from opioids. Eleven of the studies that found positive effects examined voucher-based CM strategies, three studies examined prize-based CM (including one study with methadone doses used as a prize), two studies evaluated medication-based CM strategies (Gross et al., 2006; Chopra et al., 2009), and one study evaluated contingency contracting, where participants received methadone doses contingent on meeting abstinence-related goals (Calsyn et al., 1994). Thirteen studies reported mixed findings for the effect of CM on drug use, while 11 studies reported that CM did not have any significant effects on drug use.

Treatment Retention: Retention was often measured as length of stay in treatment, treatment completion, or dropping out of treatment. A total of 33 studies examined retention outcomes. An overwhelming majority of the studies (n=21) reported that CM had no statistically significant effect on retention, while seven studies found positive effects, and five reported mixed results. Six of the seven studies reporting positive findings implemented voucher-based CM and the remaining study evaluated prize-based CM (Hser et al., 2011). Some of these studies found that CM incentives had positive effects on retention when combined with certain treatment components, such as significant other involvement (Carroll et al., 2001a), motivational enhancement counseling with membership to a treatment readiness group (Kidorf et al., 2009), or community reinforcement approaches (Christensen et al., 2014). The effectiveness of CM appeared to be influenced by various factors, including the specific implementation of CM, the treatment context, and comparison groups.

Mortality/morbidity: Seven studies examined mortality and morbidity-related outcomes. All seven evaluated voucher-based CM and four were conducted in a therapeutic workplace setting. Studies often examined HIV-related risk behaviors. Two studies also reported on participant deaths during the follow-up period (Carroll et al., 2001b; Jarvis et al., 2019). None of the studies found statistically significant differences between the CM and comparison groups in mortality and morbidity related outcomes.

Craving: Only two studies reported on the effect of CM on craving outcomes and craving was measured via questionnaire. Preston et al. (2000) investigated the impact of CM on craving outcomes and found that neither of two CM conditions had any statistically significant effects on craving. In a subsequent CM study, Preston et al. (2002) found that heroin cravings worsened for study participants regardless of the type of CM intervention and/or methadone dose they received.

Limitations

While the studies included in this review were generally characterized by strong research design, they had some limitations. Some studies were based on small sample sizes that likely limited the generalizability of their findings while potentially reducing their ability to detect statistically significant differences between the CM and comparison groups. The wide variety of CM approaches represented in the studies created challenges for drawing definitive conclusions about the most effective CM strategies. Many studies focused on short-term outcomes, with limited data on the long-term effectiveness of CM interventions. This gap in knowledge makes it difficult to assess the impact of CM on OUD treatment after an individual completes treatment. Finally, the lack of consistent fidelity measures across studies may impact the reliability and generalizability of the findings.

Conclusion

Contingency management generally seemed to show promise as a treatment approach for OUD, especially when used in conjunction with one of several effective FDA-approved medications for opioid use disorder (MOUD), including buprenorphine, methadone, and extended-release naltrexone (Carroll et al., 2001b; Jarvis et al., 2019; Oliveto et al., 2005; Proctor, 2022; U.S. Department of Health and Human Services [HHS], 2023; U.S. Food and Drug Administration [FDA], 2024).

More specifically, CM showed some promise for improving opioid and/or other substance use behaviors in people with OUDs. The reviewed studies provided less support for the effectiveness of CM for addressing OUD-related treatment retention, mortality/morbidity, or substance craving outcomes. Although most studies enrolled participants who were receiving MAT and

examined programs that prioritized positive reinforcement over punishment, the studies investigated CM programs that varied widely in implementation and design. The variety of implementation strategies represented in the reviewed studies illustrated how many aspects of CM programs can be customized or adapted to meet the needs, preferences, and values of specific populations and treatment agencies. Unfortunately, the variability in strategies also made it challenging to identify any patterns or trends regarding the most effective CM strategies for OUD treatment. Notably, fidelity was not often explored or measured in the included studies.

Some studies suggested that CM may be most effective when combined with other treatments, such as MAT or cognitive-behavioral therapy. Further research on optimal treatment combinations is warranted. Additionally, larger and longer-term studies could provide much-needed clarity on how and when CM is most effective for treating OUD. In conclusion, while CM shows some promise as a treatment component for OUD, more research is needed to optimize its implementation, understand its long-term effects, and determine how best to integrate it with other evidence-based treatments.

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