

## Contingency management: what it is and why psychiatrists should want to use it

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**Summary** Contingency management is a highly effective treatment for substance use and related disorders. However, few psychiatrists are familiar with this intervention or its application to a range of patient behaviours. This paper describes contingency management and evidence of its efficacy for reducing drug use. It then details areas in which contingency management interventions can be applied in the context of psychiatric treatments more generally, including increasing abstinence in individuals with dual diagnoses, encouraging attendance in mental health treatment settings, enhancing adherence to psychiatric medications, reducing weight, and improving exercise. Greater awareness and use of contingency management in practice may improve outcomes across a range of mental health and related conditions.

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Contingency management refers to a type of behavioural therapy in which individuals are ‘reinforced’, or rewarded, for evidence of positive behavioural change. These interventions have been widely tested and evaluated in the context of substance misuse treatment, and they most often involve provision of monetary-based reinforcers for submission of drug-negative urine specimens. The reinforcers typically consist of vouchers exchangeable for retail goods and services or the opportunity to win prizes. Although contingency management has a great deal of evidence supporting its efficacy,<sup>1</sup> and the UK National Institute for Health and Clinical Excellence guidelines recommend its use, few psychiatrists and other mental health professionals are familiar with these interventions, and even fewer implement contingency management in their practice.

### Contingency management principles

Contingency management interventions are based on principles of basic behavioural analysis. A behaviour that is reinforced in close temporal proximity to its occurrence will increase in frequency. Thus, if you give a child a small toy or sticker each time he makes his bed, the child will start making his bed more often. Behavioural principles of positive reinforcement are widely applied in everyday settings (childrearing, employment, pet training), as well as clinical settings (autism, conduct disorder in adolescents, intellectual disability).

These behavioural principles can also be applied to treat substance use disorders. In contingency management interventions for substance misuse treatment, urine samples are collected multiple times each week (to detect

brief periods of abstinence) and abstinence is reinforced each time negative samples are submitted. The reinforcers are monetary based and consist of vouchers, analogous to a clinic-managed bank account,<sup>2</sup> or a prize draw with prizes ranging from US\$1 to 100 in value.<sup>3</sup> Importantly, in effective contingency management interventions, the magnitude of reinforcement provided (voucher amounts or draws for prizes) increases with sustained periods of abstinence.<sup>2,3</sup>

### Evidence base

A vast amount of empirical evidence indicates the efficacy of contingency management for treating substance use disorders. For example, in multicentre studies conducted throughout the USA,<sup>3,4</sup> over 800 individuals with stimulant misuse from 14 clinics were randomly assigned to standard care as usual plus twice-weekly urine sample testing, or that same treatment plus contingency management for 12 weeks. In the contingency management group, individuals earned at least one draw with a chance of winning a prize ranging from US\$1 to 100 in value for each stimulant-negative sample submitted, and number of draws earned increased with weeks of consecutive abstinence. About half of the sample were recruited from psychosocial (non-methadone) and half from methadone clinics. In the psychosocial clinics,<sup>3</sup> contingency management significantly enhanced retention in treatment, with 49% of the contingency management group completing 12 weeks of treatment v. only 35% of the standard care group. The mean number of weeks of consecutive abstinence from stimulants was 4.4 for those assigned to contingency management v. 2.6 for those assigned to standard care. The percentage of individuals who sustained stimulant abstinence throughout the full

12 weeks was nearly 4 times greater for the contingency management condition (18.7% v. 4.9%). In the methadone arm of the study,<sup>4</sup> durations of continuous cocaine abstinence achieved were also significantly enhanced in the contingency management condition relative to the standard care condition, with means of 2.8 v. 1.2 weeks of abstinence respectively. Again, the contingency management group were significantly more likely to maintain continuous abstinence throughout the 12-week study period than the standard care group (5.6% v. 0.5%).

Similar beneficial results of contingency management have been reported with respect to decreasing other forms of substance use. It is efficacious in reducing opioid use, whether individuals are maintained on a substitution medication such as methadone<sup>4</sup> or undergoing opioid detoxification.<sup>1</sup> Contingency management also reduces the use of alcohol, marijuana and benzodiazepines.<sup>1</sup> Even among those who smoke cigarettes and do not wish to stop, contingency management can substantially decrease smoking.<sup>1</sup> Meta-analyses of contingency management interventions find that it is efficacious across a range of populations and settings.<sup>1</sup> A meta-analysis of psychosocial treatments for substance use disorders reveals that contingency management is the intervention with the greatest effect size.<sup>5</sup>

### Barriers to implementation

Despite its established efficacy, contingency management is the empirically validated treatment with which clinicians are least familiar. Surveys of mental health providers in the USA<sup>6</sup> and other countries<sup>7</sup> reveal that few are aware of this intervention, and even fewer use it in practice. Reasons for the lack of use range from little formal training or coursework in behaviour analysis generally or contingency management specifically, ideological concerns, disconnect between research and practice, and costs. Each of these barriers can be overcome, and introduction of contingency management techniques into substance misuse treatment and psychiatric practice more broadly can have a positive impact on patients, providers, and perhaps even society at large.

### Applicability to other settings

One area in which contingency management has widespread potential benefits is individual retention in treatment. Psychiatric treatments suffer from high rates of attrition, which in turn relates to increased morbidity and mortality. Substance misuse treatment clinics typically experience attrition rates of 80% or higher, and attrition is high in most other out-patient mental health treatment as well. By providing reinforcement contingent on attendance, attendance rates across a range of treatment settings can be substantially improved,<sup>1-3</sup> thereby increasing exposure to effective care.

Contingency management is not only useful for enhancing retention in treatment and decreasing drug use in primary substance misuse treatment-seeking samples, but also for individuals with dual diagnosis, in whom rates

of substance use disorders are disproportionately high. Several studies now point to the effectiveness of contingency management for reducing cocaine and marijuana use in people with psychotic disorders.<sup>8</sup> Extraordinarily high rates of smoking are noted in individuals with schizophrenia and contingency management holds promise for decreasing smoking in this group too.<sup>9</sup>

Another application for contingency management highly relevant to psychiatrists relates to reinforcing adherence to medications. Provision of reinforcement for direct supervised ingestion of medications has proven successful in some populations.<sup>10</sup> Such procedures may be particularly useful for psychiatric patients with low levels of adherence to some medications. Other options that do not require direct supervision of medication ingestion include reinforcing MEMS (Medication Events Monitoring System) cap openings, an approach that has been successful in increasing adherence to antiretroviral medications in individuals with HIV.<sup>10</sup>

Two additional applications of contingency management are relevant to psychiatry. The intervention appears to be useful in assisting individuals to lose weight.<sup>11</sup> Given high comorbidity between overweight/obesity and psychiatric disorders, contingency management for weight loss may be advantageous in psychiatric patients with obesity. On a related note, contingency management appears effective in increasing adherence to exercise regimens.<sup>12</sup> Given the inverse association between regular exercise and depressive symptoms, reinforcing individuals for objective evidence of initiating and maintaining exercise routines may have positive benefits with respect to mental health as well as physical health outcomes.

### Advantages to healthcare providers

Not only do patients stand to gain by the introduction of contingency management but so do providers. A positive report comes from the introduction of contingency management into standard practice in substance misuse treatment programmes in New York.<sup>13</sup> As individuals were reinforced for attending groups, group sizes and participant morale increased, along with provider morale. Lott & Jencius<sup>14</sup> found that reimbursement rates substantially increased when contingency management was introduced to adolescents who misused substances.

Cost concerns remain paramount regarding the use of contingency management, and research reveals that efficacy is reduced if reinforcement magnitude is too low.<sup>1</sup> However, evaluations of new methods of reinforcement show that costs can be minimised and beneficial effects still remain.<sup>15</sup> Further, cost-effectiveness analyses of contingency management find that sometimes increasing the upfront magnitude of reinforcement can result in greater cost-effectiveness with respect to patient outcomes.<sup>16</sup>

Clinics in Spain, Canada and the USA have reported that some or most of the reinforcers for contingency management can be obtained via community donations.<sup>17</sup> These approaches may be particularly advantageous with respect to raising funds for highly vulnerable populations, such as pregnant women, adolescents, people with HIV,

homeless individuals, and those with severe and persistent mental health disorders.

In sum, contingency management interventions have substantive evidence of efficacy in positively modifying a variety of patient behaviours, and adaptations of these techniques to a variety of problem behaviours may further increase their relevance and widespread use. Eventually, greater understanding and awareness of contingency management may assist in bringing this empirically based intervention into a variety of psychiatric settings and specialty areas.

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