DRUG & ALCOHOL FINDINGS *Review analysis*

This entry is our analysis of a review or synthesis of research findings added to the Effectiveness Bank. The original review was not published by Findings; click Title to order a copy. Links to other documents. Hover over for notes. Click to highlight passage referred to. Unfold extra text The Summary conveys the findings and views expressed in the review. Below is a commentary from Drug and Alcohol Findings.

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▶ How can contingency management support treatment for substance use disorders? A systematic review.

Ferroni E., Minozzi S., Vecchi S.

European Monitoring Centre for Drugs and Drug Addiction, 2016.

Rewarding people dependent on illegal drugs for not using those drugs is a controversial tactic, one this review from the EU's drug misuse centre found patchily effective in extending retention and reducing substance use as a supplement to medication-based treatments.

SUMMARY In the treatment of drug dependence, contingency management procedures aim to alter drug use by systematically arranging for use and non-use to have predictable consequences. The approach is based on 'operant conditioning' principles, which theorise that pleasant consequences reinforce or strengthen behaviours associated with them, while aversive consequences discourage associated behaviours.

Contingency management reinforcers may be cash, vouchers, prizes, or perceived privileges, such as being able to take prescribed methadone at a time and place of your choosing. Patients gain or lose reinforcers depending on whether they consistently and regularly achieve the expected outcomes – usually avoidance of targeted forms of substance use.

The featured review aimed to assess the effectiveness and cost-effectiveness of contingency management when used to supplement medication-based detoxification programmes, or the prescribing of medications like methadone to substitute for the drug on which the patient has become dependent. Included were studies which randomly (or effectively at random) allocated adult patients dependent on any illicit substance to a medication-based treatment with versus without contingency management. A comprehensive search was conducted for relevant studies reported in any language. It was intended to amalgamate their findings, but this proved inappropriate because studies were not comparable and did not provide sufficient details. The analysis was therefore limited to counting the number of studies with statistically significant results for each relevant outcome.

In all, 185 documents were included in the review, relating to effects on patients dependent on opioids, cocaine, both these drugs, cannabis, or stimulants. Studies of other patients identified as misusing several substances at once were not analysed.

Key points
From summary and commentary

In the treatment of problem drug use, contingency management is the systematic application of positive and negative incentives linked to improvements in substance use and/or engagement in therapeutic activities.

The featured review assessed whether using those procedures to supplement pharmacotherapies for problem use of illegal drugs extended retention and improved substance use outcomes.

Evidence was strongest for reducing cocaine use among methadone patients also dependent on cocaine, and somewhat positive for reducing illicit opioid use among opioid substitute prescribing patients in general.

Main findings

Cannabis No study was found which assessed the effectiveness of contingency management as an addition to treatment based on substitute or detoxification medications.

Cocaine Three US studies were found of in total 447 cocaine-dependent patients who were rewarded for urine samples indicative of non-use of cocaine. One study combined contingency management with tryptophan, one levodopa, and one naltrexone. All three assessed retention and abstinence: in none was retention in treatment significantly altered by contingency management, but in two each the average proportion of urine tests negative for cocaine, or continuous abstinence from the drug, were significantly improved.

Other stimulants Just one relevant study of stimulant-dependent patients was found, involving 229 US patients diagnosed as dependent on or abusing methamphetamine who had been allocated at random to

the medication sertraline or to a placebo, in each case with or without contingency management. Vouchers with a monetary value were given in response to urine tests indicative of non-use of methamphetamine. Retention was not reported, but contingency management patients used methamphetamine fewer times.

Opioids 1,676 opioid-dependent patients were involved in the 20 included studies, of which 16 were conducted in the USA. Though other measures were taken, all assessed opioid use via urine tests, rewarding positive results on this and other criteria in a variety of ways, including allowing patients to take their medications at home and rewards with a monetary value.

Ten studies supplemented treatment based on substitute prescribing with contingency management. Only in three of the eight to assess this did contingency management significantly extend retention. Three of seven studies found significant improvements in the proportion of urine tests indicative of non-use of opioids, and three of four in continuous abstinence from opioids. None of the three to assess this found cocaine test results significantly improved.

Two of the three detoxification studies found retention in treatment significantly improved by contingency management. One of the two to assess this found a significant improvement in the proportion of urine tests indicative of non-use of opioids. All three studies assessed continuous abstinence from opioids, and two reported statistically significant improvements in favour of contingency management.

All seven studies of treatment based on the opiate-blocking medication naltrexone assessed retention, and five found it significantly extended by contingency management. All seven also assessed the proportion of urine tests indicative of non-use of opioids, but just one reported statistically significant results in favour of contingency management. One of the two to assess continuous abstinence from opioids found this promoted by contingency management.

Opioids and cocaine All from the USA, the 14 relevant studies enrolled 1,550 patients dependent on both cocaine and opioids. All assessed the impact of supplementing substitute prescribing programmes (in all but two cases, methadone maintenance) with contingency management, and rewarded urine tests indicative of non-use of either opioids, cocaine, or both, generally by giving patients vouchers or prizes with monetary values.

Only one of the 12 studies to assess this found a significant extension in retention. Ten of the 13 studies to assess urine tests indicative of cocaine use found the results significantly in favour of contingency management, as did all eight studies to assess continuous abstinence from the drug. However, for opioids only two of eight studies found urine test results significantly improved by contingency management. Both studies to assess this found continuous abstinence from opioids promoted by contingency management.

Economic evaluations Published in 2015, a review noted that all the studies to supplement treatments for illegal drug use with contingency management found this improved effectiveness, but also raised treatment costs. However, other possible savings in social costs (such as in relation to crime) were not assessed, and studies had small samples and were conducted only in the USA.

The current review identified two additional studies which estimated costs and benefits in relation to crime among US adolescents, seemingly based on the same small sample. Both found treatment involving contingency management the most costly of the options evaluated. One study found that nevertheless, this option was the most cost-effective at reducing 'polydrug' use of several substances, drinking, and heavy drinking. These results cannot be assumed applicable to other contexts, but support the earlier review's conclusion that evidence for cost-effectiveness is not yet strong enough to make any firm recommendations on implementing what may be a promising strategy.

The authors' conclusions

Findings of the featured review indicate that contingency management is a feasible and promising adjunct to pharmacotherapies for problem drug use. Overall, studies show it can help retain patients in treatment, and promote reduction of opioid and cocaine use among opioid substitution patients. Data on patients with other substance-related problems are more scarce. Adding contingency management to treatment increases treatment costs, but may reduce overall social costs in the longer term.

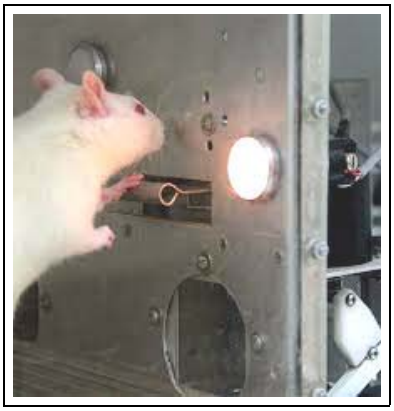
The featured review's major limitation was the inability to amalgamate the results of the studies. Also, no attempt was made to assess whether studies whose results did not favour contingency management were disproportionately missed by the search for trials. However, so comprehensive was the search strategy that this seems unlikely.

FINDINGS COMMENTARY A limitation not of the review, but of the studies it had to rely on, was that follow-up periods were generally short, just a few months probably largely confined to the period when rewards were available. Evidence that effects are sustained after rewards end is a major gap in findings on contingency management, one which undermines confidence in the long-term cost-savings hoped for by the featured review.

A limitation of the review itself is that it did not relate substance use outcomes to the substance targeted by the contingency management programme. It is, for example, understandable if opioid use is not reduced when a programme solely targets cocaine use, but the same result would have to be considered a failure if opioid use was a target.

Contingency management was one of only two psychosocial therapies recommended by the UK's National Institute for Health and Care Excellence (NICE) for the treatment of problems related to illicit drug use. Typically the promising results which persuaded the NICE committee were seen during the time rewards and sanctions were in place, often just 12 weeks; many trials do not go beyond that to see if benefits persist. The approach was evaluated and promoted by England's National Treatment Agency for Substance Misuse before its absorption into Public Health England in 2013.

Benefits while rewards and sanctions are in place must be set alongside ethical concerns, including the possible aggravation of health inequality if only already advantaged patients qualify for prizes and benefit from any therapeutic effects, professional and public resistance to rewarding what most people do simply for their own welfare and to comply with the law, the common finding that in-treatment gains do not persist, and some evidence that intrinsic motivation to overcome dependence may be undermined if patients see themselves as 'just doing it for the prizes'. Some of these themes have been explored further in an Effectiveness Bank hot topic. This makes the point that unlike the rat studies from which operant conditioning principles were derived, what the patient makes of their spell on the rewards and how they interpret the contingency management system determines whether it will result in a transient, reward-driven curb in substance use, or more lasting change.



The rat in the Skinner box may cogitate little on why they have to press a lever for food, but human beings try to make sense of what is happening to them.

Thanks for their comments on this entry in draft to review author Silvia Minozzi of the Cochrane Drugs and Alcohol Group. Commentators bear no responsibility for the text including the interpretations and any remaining errors.

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