

# Contingency Management for Stimulants and Other Drug Use Disorders

**Jared W. Klein, MD, MPH**  
**Assistant Professor**  
**Division of General Internal Medicine**  
**University of Washington School of Medicine**

October 5, 2021

# Guest Speakers

**Sarah Leyde, MD**

**Clinical Instructor**

**Division of General Internal Medicine**

**University of Washington School of Medicine**

**Jonathan Buchholz, MD**

**Assistant Professor**

**Department of Psychiatry and Behavioral Sciences**

**University of Washington School of Medicine**

# Disclosures

---

No conflicts of interest or relationships to disclose

# Learning objectives

*At the conclusion of this talk, learner will be able to:*

- Describe the rationale for using contingency management interventions in stimulant use disorder treatment.
- Summarize the key elements of contingency management interventions.
- Compare two real-world contingency management interventions in clinical practice.

# Outline

- What is contingency management?
- Evidence behind contingency management
- Case Study 1: The Heart Plus Clinic (UCSF)
- Case Study 2: The VA Addiction Treatment Center (Seattle)
- Discussion / Q&A

# Operant conditioning

- Concept of developing an association between a voluntary behavior and a consequence.
- Studies of contingency management primarily rely on **positive reinforcement**

	Something “ <b>Bad</b> ” (aversive)	Something “ <b>Good</b> ” (rewarding)
<b>Giving</b> (positive)	Positive Punishment (behavior is weakened)	Positive Reinforcement (behavior is strengthened)
<b>Taking Away</b> (negative)	Negative Reinforcement (behavior is strengthened)	Negative Punishment (behavior is weakened)

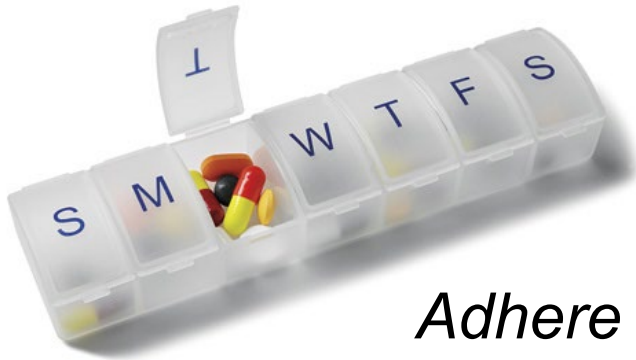
# Incentives to complete the desired behavior



*Attend treatment*



*Provide negative urine sample*



*Adhere to medication*

# Where and how has contingency management been studied?

- Studies have been completed in primary and specialty care settings
- Frequently rely on intensive drug testing
- Typical treatment courses are 12-24 weeks
- Often paired with other behavioral support (cognitive behavioral therapy, positive affect therapy, case management, etc.)



# Intermittent prize reinforcement

- aka “fishbowl” method
- Variety of prizes:
  - Some have no monetary value (e.g., “good job!”)
  - Many have small value
  - A few have large value
- Participants get increased number of draws for continuous maintenance of desired behaviors



*NY Times, 10/27/2020*

# Voucher reinforcement



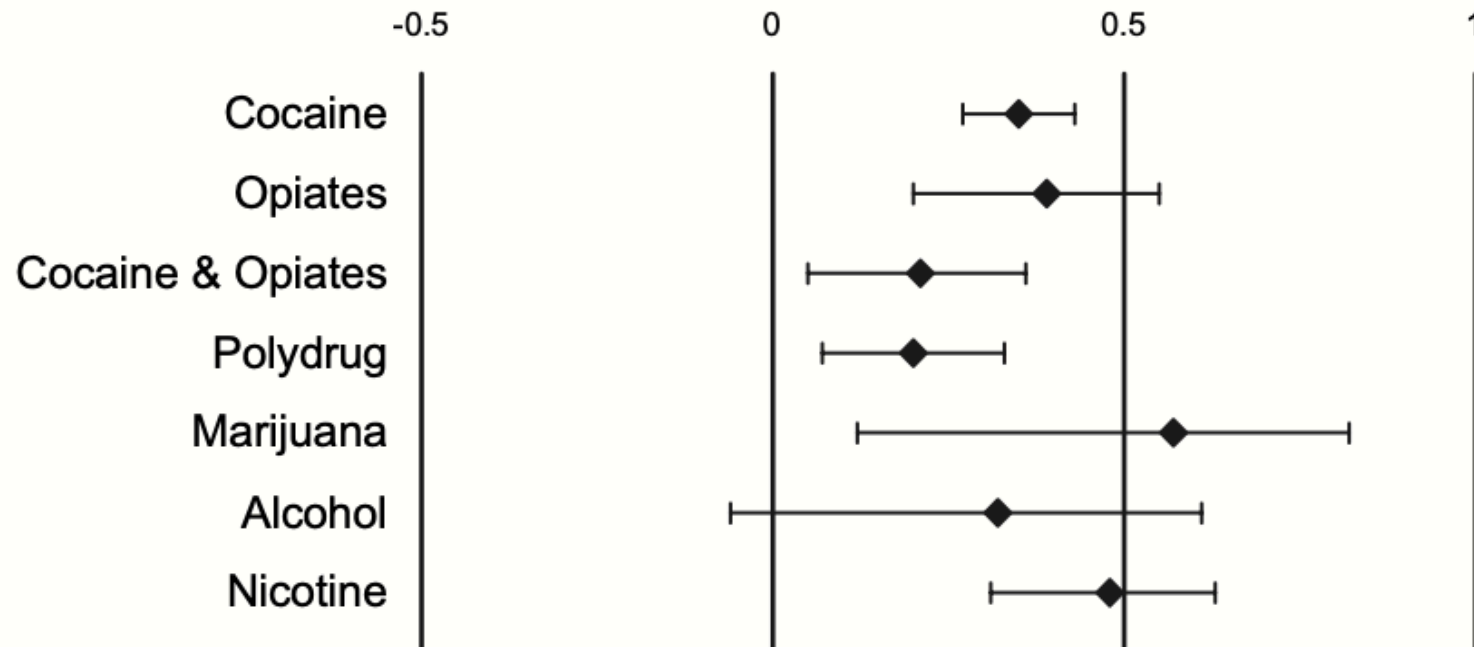
- Structured payments that start small and escalate the longer desired behaviors are maintained
- Vouchers might be reimbursed for cash, credit at locations (grocery store) or prizes
- Voucher amounts are usually under \$20)

# What is the evidence for contingency management?

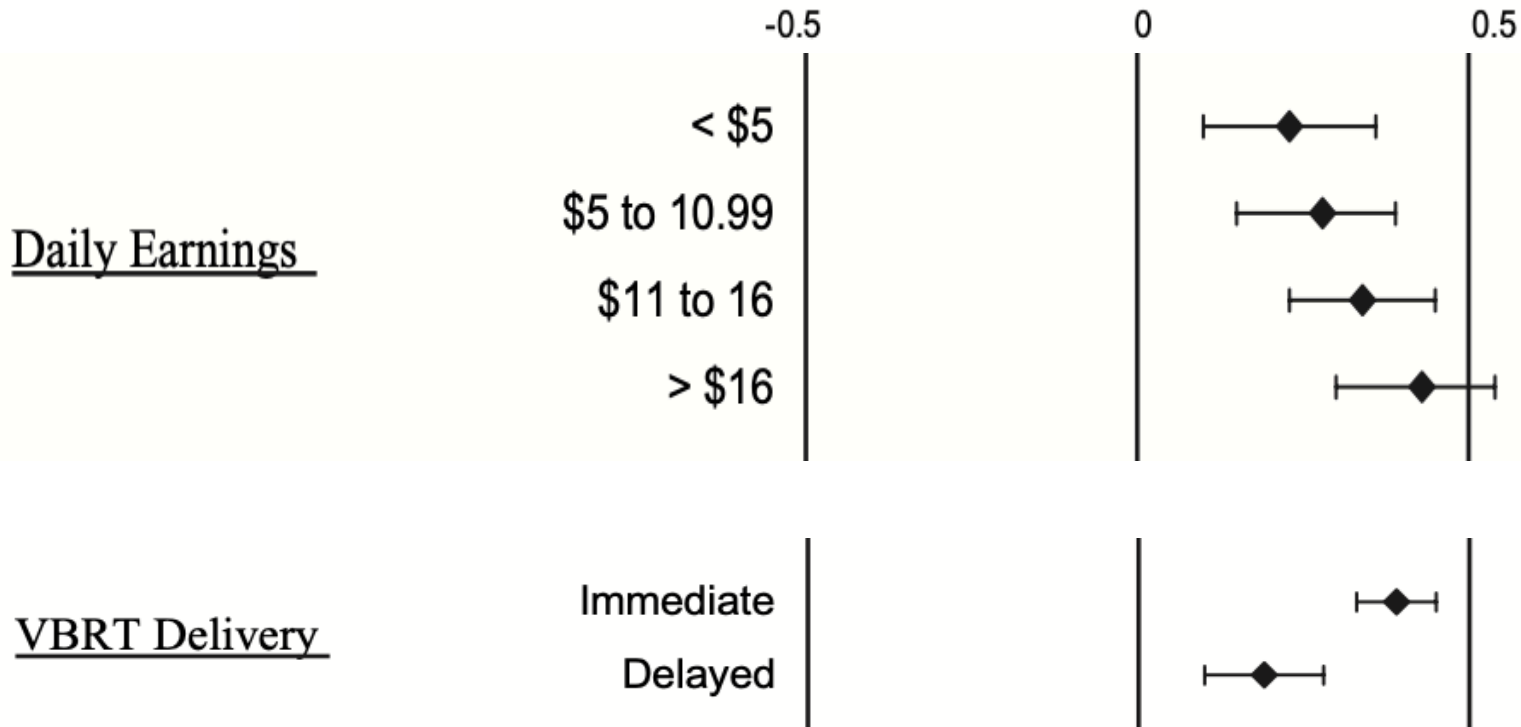
- 2006 metanalysis of voucher-based reinforcement therapy (VBRT)
- 30 studies were included with abstinence outcomes
- Effect sizes are defined by correlation coefficients (“r”):
  - Small ( $r = 0.1$ )
  - Medium ( $r = 0.3$ )
  - Large ( $r = 0.5$ )

# VBRT effective for a variety of SUDs

- Substantial variability, but overall medium effect across all studies for VBRT versus control conditions ( $r=0.32$ ,  $p<0.001$ )
- Larger effect size for cocaine, opioids and nicotine

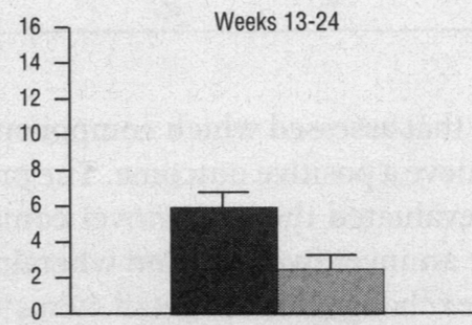
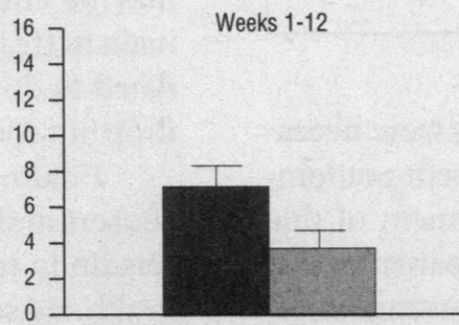
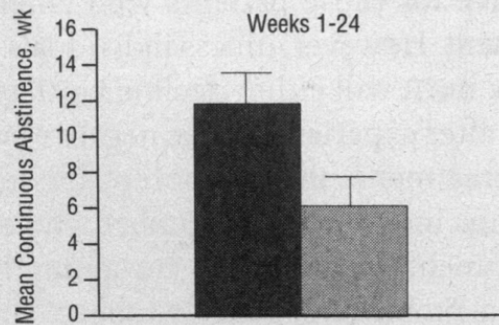
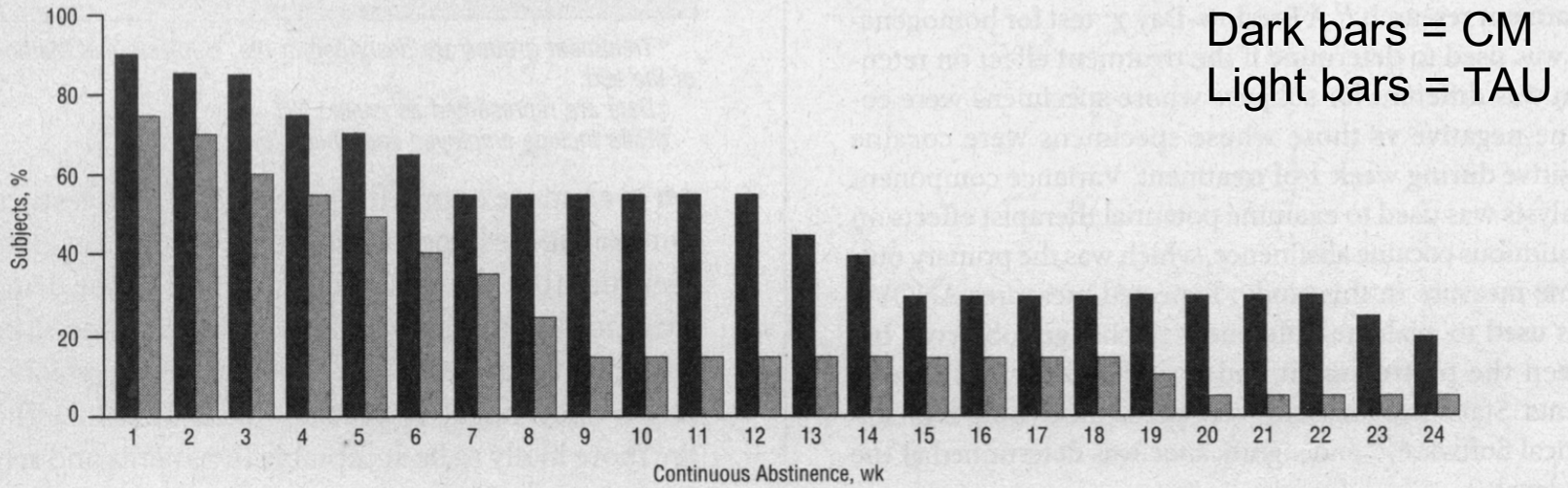


# Larger values and more immediate rewards are more effective



# Example 1: VBRT effective for cocaine use

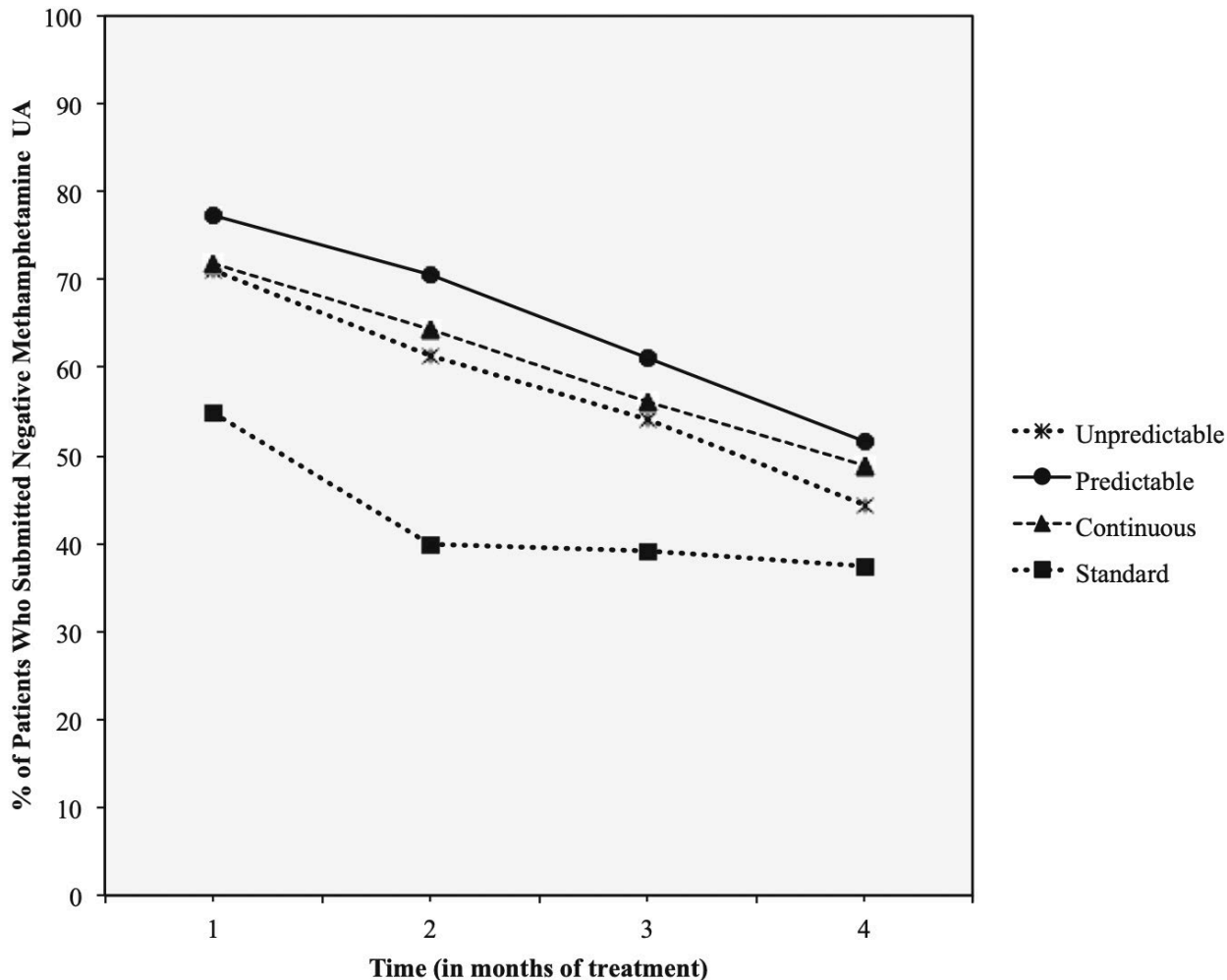
- Patients: 40 subjects with cocaine use disorder treated for 24 weeks
- Intervention: Escalating value vouchers if urine samples negative for cocaine starting at \$2.50 up to a maximum of \$45 (plus bonuses); maximum for study period was \$1000
- Control: Slip of paper with test result (positive/negative)
- Outcome: Mean continuous cocaine abstinence



# Example 2: VBRT effective for meth use

- Patients: 120 subjects seeking treatment for meth use disorder treated for 16 weeks
- Intervention: Escalating value vouchers if urine samples negative for meth
  - Continuous: Started at \$2.50, increase by \$1.50 for each subsequent negative sample
  - Predictable: Started at \$22 for a week of negative samples, increased by \$13.50 for each subsequent week
  - Unpredictable: Same as above, but reward might come any day of the week
- Control: No voucher
- Outcome: Proportion of urine samples negative for meth



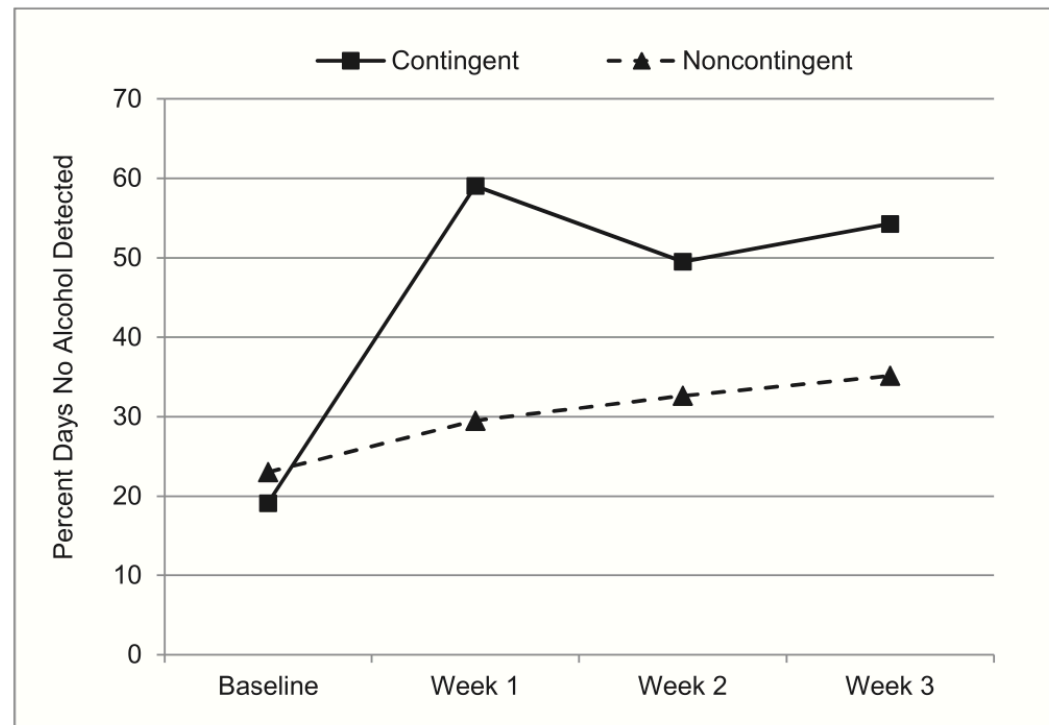


- Odds of meth negative urine sample 2x greater in any CM group versus control ( $p < 0.05$ )
- No differences between 3 CM groups

# Example 3: Cash reinforcement for alcohol

- Patients: 30 adults with alcohol use disorder treated for 4 weeks
- Intervention: \$5 cash for first day without drinking, increased by \$2 each subsequent day up to \$17, no reward on drinking days and reset to \$5 the subsequent day
- Control: Non-contingent reinforcement (\$0-17)
- Outcome: Percent of days with no alcohol detected on transdermal alcohol device

- CM had higher percentage of days with no alcohol detected (53%) versus control (31%),  $p=0.05$
- Intervention group had longer continuous abstinence, lower peak alcohol content and more consumption within recommended limits



# Implementation challenges



- Not always reimbursed by payers
- Requires intensive staffing and training
- May be unfamiliar to patients and staff
- Behaviors often reverts after treatment stops
- Ethical critiques (“bribery” or “coercion”)

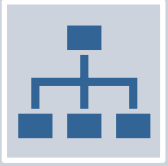
# Dr Sarah Leyde

- UCSF Heart Plus Clinic

# Dr Jonathan Buchholz

- Seattle VA Addiction Treatment Center

# Panel Discussion



What were the key aspects of implementing contingency management in your practice setting?



What advice do you have for clinicians interested in launching a contingency management program?



What role do you imagine contingency management might have in the future of substance use treatment?

# References

- Lussier JP, Heil SH, Mongeon JA, Badger GJ, Higgins ST. A meta-analysis of voucher-based reinforcement therapy for substance use disorders. *Addiction*. 2006 Feb;101(2):192-203.
- Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: a meta-analysis. *Addiction*. 2006 Nov;101(11):1546-60.
- Higgins ST, Budney AJ, Bickel WK, Foerg FE, Donham R, Badger GJ. Incentives improve outcome in outpatient behavioral treatment of cocaine dependence. *Arch Gen Psychiatry*. 1994 Jul;51(7):568-76.
- Chudzynski J, Roll JM, McPherson S, Cameron JM, Howell DN. Reinforcement Schedule Effects on Long-Term Behavior Change. *Psychol Rec*. 2015 Jun 1;65(2):347-353. doi: 10.1007/s40732-014-0110-3. PMID: 26139942; PMCID: PMC4484864.
- Barnett NP, Celio MA, Tidey JW, Murphy JG, Colby SM, Swift RM. A preliminary randomized controlled trial of contingency management for alcohol use reduction using a transdermal alcohol sensor. *Addiction*. 2017 Jun;112(6):1025-1035.
- Petry NM. Contingency management treatments: controversies and challenges. *Addiction*. 2010 Sep;105(9):1507-9.



# Acknowledgment

This Mountain West AIDS Education and Training (MWAETC) program is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$2,911,844 and as part of another award totaling \$400,000 with 0% financed with non-governmental sources.

The content in this presentation are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government.

