

Contingency Management for the Treatment of Stimulant Use Disorder

Indiana University School of Medicine - Project ECHO
MARCH 24th, 2021

Dominick DePhilippis, Ph.D.

Education Coordinator

Philadelphia Center of Excellence in Substance Addiction Treatment & Education (CESATE)

In Memoriam



This presentation is dedicated with enduring admiration and gratitude to the memory of Nancy M. Petry, Ph.D. (1968-2018).

Objectives

The participant will be able to:

- * Describe the scope of the problem of stimulant use disorder and the challenges to recovery.
- * Differentiate the rationale and methods of Contingency Management (CM)
- * Describe the evidence supporting CM effectiveness.
- * Apply COVID-19 precautions to CM clinical encounters.

Regional Differences in the Drugs Most Frequently Involved in Drug Overdose Deaths: United States, 2017

by Holly Hedegaard, M.D., M.S.P.H., and Brigham A. Bastian, B.S., National Center for Health Statistics; James P. Trinidad, M.P.H., M.S., U.S. Food and Drug Administration; and Merianne Rose Spencer, M.P.H., and Margaret Warner, Ph.D., National Center for Health Statistics

Table A. Drugs most frequently involved in drug overdose deaths: United States, 2017

Rank ²	Referent drug group	United States (<i>n</i> = 70,237, 21.7) ¹		
		Number of deaths	Percent ³	Age-adjusted rate ⁴
1	Fentanyl	27,299	38.9	8.7
2	Heroin	15,982	22.8	5.0
3	Cocaine	14,948	21.3	4.6
4	Methamphetamine	9,356	13.3	2.9
5	Alprazolam	6,647	9.5	2.1
6	Oxycodone	6,053	8.6	1.8
7	Morphine	4,874	6.9	1.5
8	Methadone	3,286	4.7	1.0
9	Hydrocodone	3,072	4.4	0.9
10	Diphenhydramine	2,286	3.3	0.7
11	Clonazepam	2,055	2.9	0.6
12	Diazepam	2,025	2.9	0.6
13	Gabapentin	1,848	2.6	0.6
14	Amphetamine	1,581	2.3	0.5
15	Itramadol	1,333	1.9	0.4

¹Number and age-adjusted rate (deaths per 100,000 standard population) for all drug overdose deaths. Age-adjusted death rates were calculated using the direct method and adjusted to the 2000 standard population.

²Drugs were ranked by number of deaths. Ranks were not tested for statistical significance.

³Percentage of drug overdose deaths that involve the referent drug group.

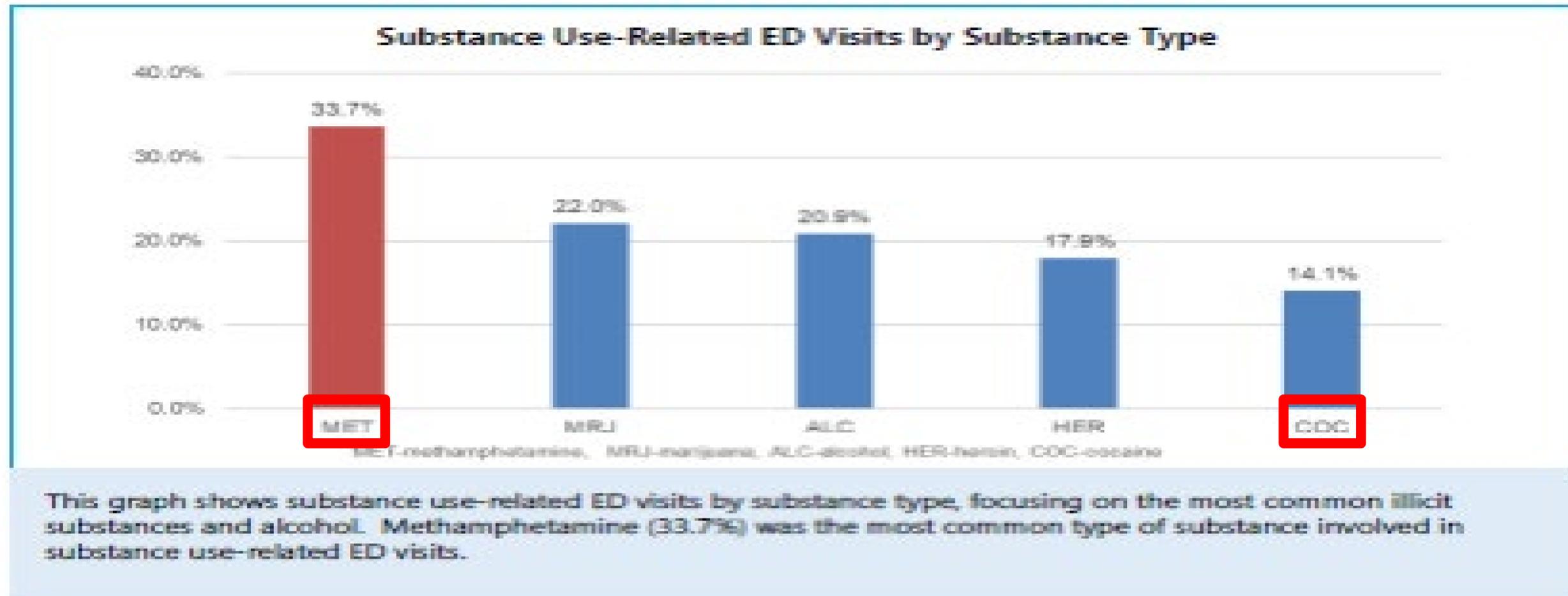
⁴Age-adjusted death rates (deaths per 100,000 standard population) were calculated using the direct method and adjusted to the 2000 standard population.

NOTES: Drug overdose deaths were identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Deaths may involve other drugs in addition to the referent drug group. Deaths involving more than one referent drug group (e.g., a death involving both heroin and cocaine) were counted in both totals. To avoid counting the same death multiple times, the numbers for drug-specific deaths should not be summated.

SOURCE: NCHS National Vital Statistics System, Mortality files linked with death certificate literal text, 2017.

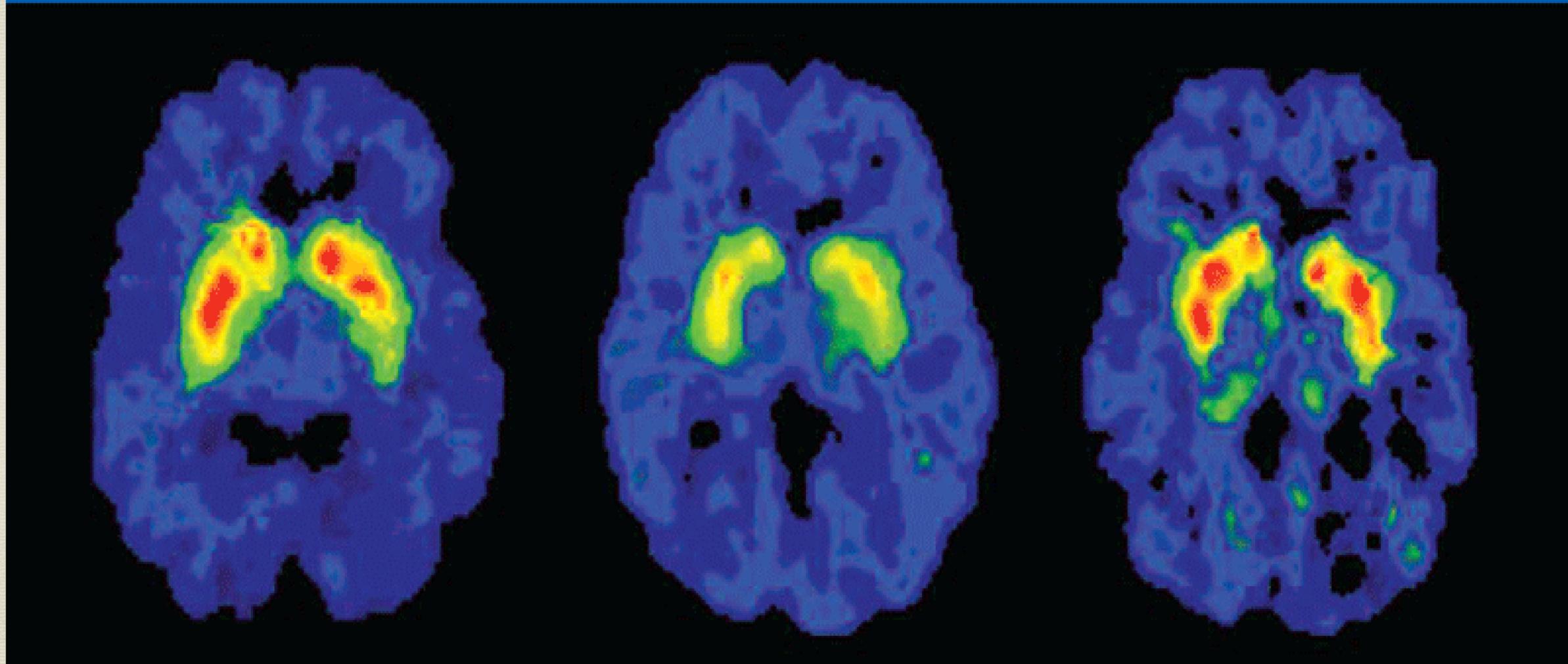
2020 Data from SAMHSA's Drug Abuse Warning Network (DAWN)

Data on substance-related ED visits from 50 non-Federal hospitals



Recovery from SUD: The Neurophysiological & Time Challenges

BRAIN RECOVERY WITH PROLONGED ABSTINENCE



Healthy Control

**One month abstinent
from Methamphetamine**

**14 months abstinent
from
Methamphetamine**

Recovery from SUD: The Treatment Attrition Challenge

- * SUDs are chronic illnesses that respond best to continuing care. Yet traditional treatment attendance is often sporadic.
- * Attrition rates range from 50% to 60% among inpatients to more than 70% after just four sessions of outpatient treatment.
- * Repeated (rather than continuous) episodes of SUD specialty care are associated with greater subsequent utilization of high cost services (Hawkins et al., *JSAT*, 2012).

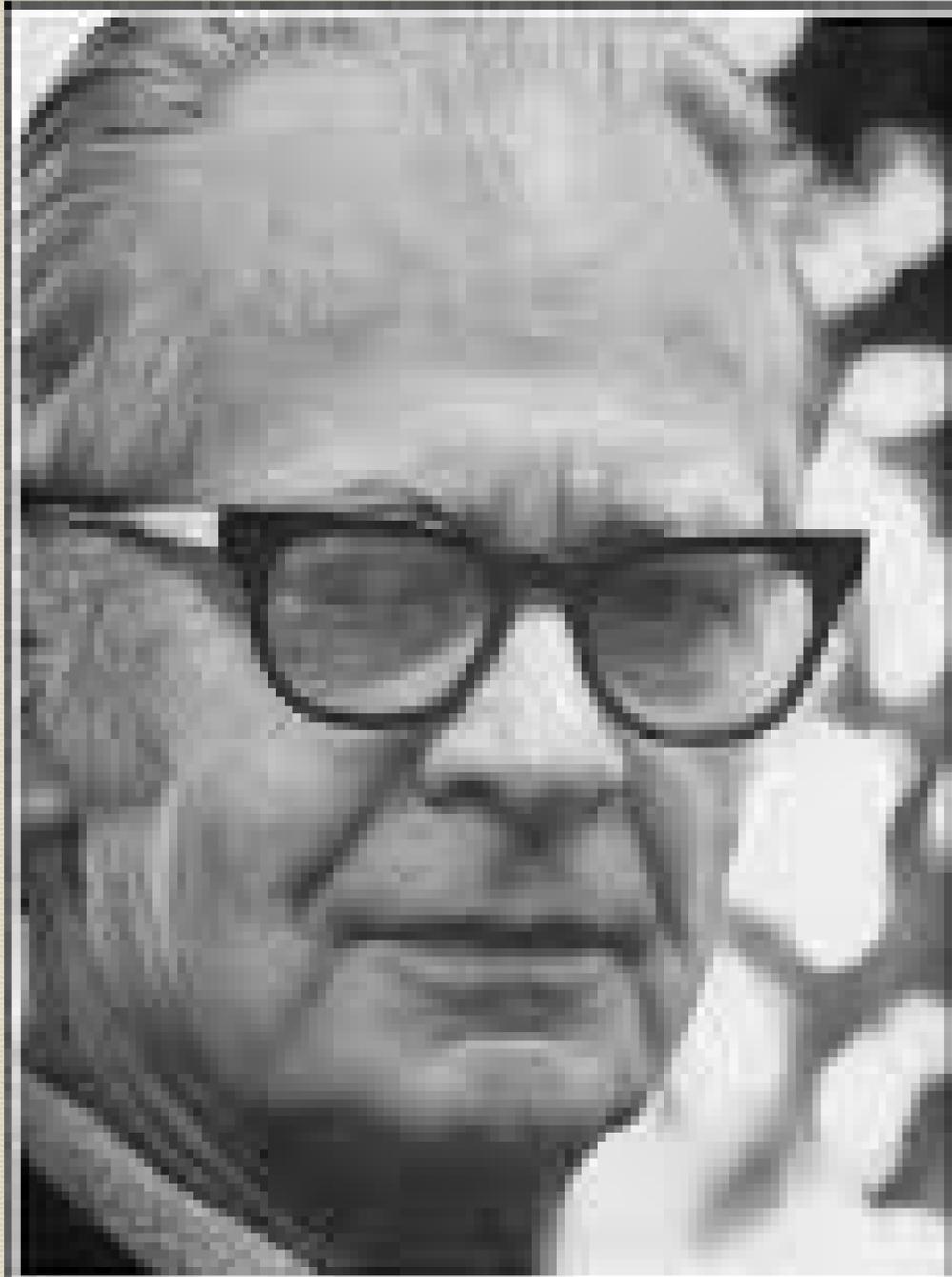
Recovery from SUD: The Cognitive-Behavioral Challenge

- * Patients with SUDs face a daunting challenge:
 - * On the one hand, substance use presents an opportunity for immediate positive and negative reinforcement and, typically, delayed and uncertain aversive (punitive) consequences.
 - * On the other hand, recovery presents the opportunity for delayed and uncertain positive and negative reinforcement and, sometimes, immediate aversive (punitive) consequences, e.g. withdrawal, loss of SUD social network, lucid assessment of the devastation brought on by SUD.
- * Because immediacy of reinforcement is crucial, the challenge is to make recovery immediately reinforcing.

CM Makes Early Recovery Rewarding

- * CM is an evidence-based SUD treatment that promotes healthy behavior via learning contingencies, e.g. providing immediate, reliable, positive reinforcement for recovery-supportive behaviors such as abstaining from substances, attendance in group, or medication adherence.
- * The likelihood that behaviors will increase depends on the size (magnitude), contiguity (timing), and contingent (exclusive) delivery of reinforcement.
- * Delayed, smaller, and non-contingent reinforcement is less likely to change behaviors.

Method is key!



The way positive reinforcement is carried out is more important than the amount.

— B. F. Skinner —

AZ QUOTES

How does CM work?

- * Select a specific, objective target behavior, e.g. abstinence.
- * Measure the target behavior objectively and frequently.
- * Provide immediate, tangible, desirable rewards when the target behavior occurs.
- * Escalate the size of the reward for consistent behavior.
 - * Escalating rewards result in continuous abstinence (Roll et al., 1996), a strong and consistent predictor of long-term abstinence (Higgins et al., 2000; Petry et al., 2005,2007).
- * Withhold rewards when the target behavior does not occur.
- * Re-set the size of the reward for the next occurrence of the target behavior.

The Prize/Fishbowl CM Protocol (Abstinence)

- Patients earn prizes of varying magnitude based on draws from a fishbowl.
- The fishbowl contains 500 prize slips:

250(50%) “Good Job!”	209(41.8%) “Small”=\$1
40 (8%) “Large”=\$20	1 (0.2%) “Jumbo”=\$100
- Draws start at 1 for the first negative sample and escalate (to a cap of ~8) with consistent abstinence.
- When abstinence is not verified, no draws are earned, and draws reset to 1 for the next negative sample.
- **Average cost per patient over 12 weeks is ~\$200.**

Implementation Concerns

- * Target Drug (Why not total abstinence?)
 - * Most commonly stimulants, sometimes cannabis, soon alcohol?
 - * Opioids can be targeted only with patients for whom MOUD is unavailable or unacceptable. The target (testing) must include ALL opioids and opiates.
- * Measuring abstinence? Toxicology testing with immediate results.
- * Who administers CM?
- * Reinforcing attendance or participation?
- * What about substance use when the target isn't abstinence?
- * Type of reward?
- * Preventing fishbowl fraud.
- * Frequency of sessions?
- * Platform program? CM works with ALL forms of treatment and can be delivered in any setting.
- * Contraindications?
 - * (1) Medications that can produce false-positives for the target drug; (2) test results can be used punitively; (3) Received CM in past 12months.

Abstinence CM Outcomes: The Empirical Literature

- * Meta-analysis of 47 CM studies with treatment/control group design published between 1970-2002.
 - * **Mean effect size =.42 (22% improvement in success rate).**
 - * “Among the more effective approaches to promoting abstinence during the treatment of substance use disorders.”
 - * **Prendergast et al., *Addiction*, 2006**
- * Meta-analysis of 34 well-controlled studies of psychosocial SUD treatments (including CM, relapse prevention, CBT, and treatments combining CBT and CM) published between 1992-2004.
 - * **Mean CM effect size =.58 (28% improvement in success rate).**
 - * “The strongest effect was found for contingency management interventions.”
 - * **Dutra et al., *American Journal of Psychiatry*, 2008**
- * Meta-analysis of 23 randomized trials of CM, with 25 or more participants in each condition, that included evaluation of post-treatment outcomes, and were published in any year through July 2020.
 - * **22% greater likelihood of abstinence at a median of 24 weeks post-treatment.**
 - * “These results provide support of lasting benefits of CM after reinforcers have been discontinued using objective indices of drug use outcomes.”
 - * **Ginley et al., *Journal of Consulting and Clinical Psychology*, 2021**

Published Outcomes of VA's Abstinence CM Implementation: 2011-2015

* **Patient Enrollment in CM**

- * From June 2011 to December 2015, VA provided CM to 2060 Veterans in 94 SUD treatment programs.

* **Attendance Outcomes**

- * Fifty percent of CM patients completed 14 or more CM sessions in a 12-week period.
- * In comparison, Oliva et al. (2013; Psychiatr. Serv.) found that only 42% of VA patients with an outpatient SUD treatment episode completed more than two sessions of care in a one year period.

* **Substance Use Outcomes**

- * 91.9% of the 27,850 Veterans' urine samples tested negative for the target substance.

CM in the COVID Era

- * **All the COVID precautions that apply to any behavioral health encounter should apply to CM as well, i.e. social distancing, masks, eye protection, gloves, hand sanitizing..**
- * Urine sample collection need not be observed, so social distancing can be accommodated in that process.
- * Draws can be done one of three ways: (1) by the gloved provider in full view of the patient; (2) by the patient (gloved or sanitizing hands before and after draws) and in full view of the provider; (3) by the provider or patient using the newly available, Excel-based, electronic fishbowl (courtesy of T. Motoyama, Honolulu VAMC).
- * Rewards can be disbursed while maintaining social distancing, i.e. provider places prizes on a table and backs away, patient retrieves prizes and backs away.

CM Implementation Challenges

- *Budget Support for Incentives
- *Changing the clinical culture
 - * Incentive rather than punitive
 - * Zero-tolerance SUD treatment programs
 - * “Philosophical” opposition to CM
- *Training and Coaching
- *CM in the age of COVID: Telehealth-administered CM

Why use CM?

For at least 6 reasons...

- 1) **It's needed and it works!**
- 2) **It can be delivered by LIPs or non-LIPs!**
- 3) **It's brief!** Sessions can be completed in as little as 6-10 minutes.
- 4) **It's low-cost!** Prize CM costs an average of \$200 in incentives per patient.
- 5) **It can be combined with any other SUD treatment, e.g. medication, psychotherapy, self-help, etc.!**
- 6) **It's fun!** Prepare for smiles, shouts, and happy dances.

Thank you!

**Your questions and comments
are welcomed!**