CASE-BASED LEARNING COLLABORATIVE ON STIMULANTS

CME BI-WEEKLY SERIES

CENTER FOR BEHAVIORAL AND ADDICTION MEDICINE

UCLA DEPARTMENT OF FAMILY MEDICINE

1st and 3rd - Fridays at 12pm-1pm PT

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Contingency Management in the Treatment of Substance Use Disorder

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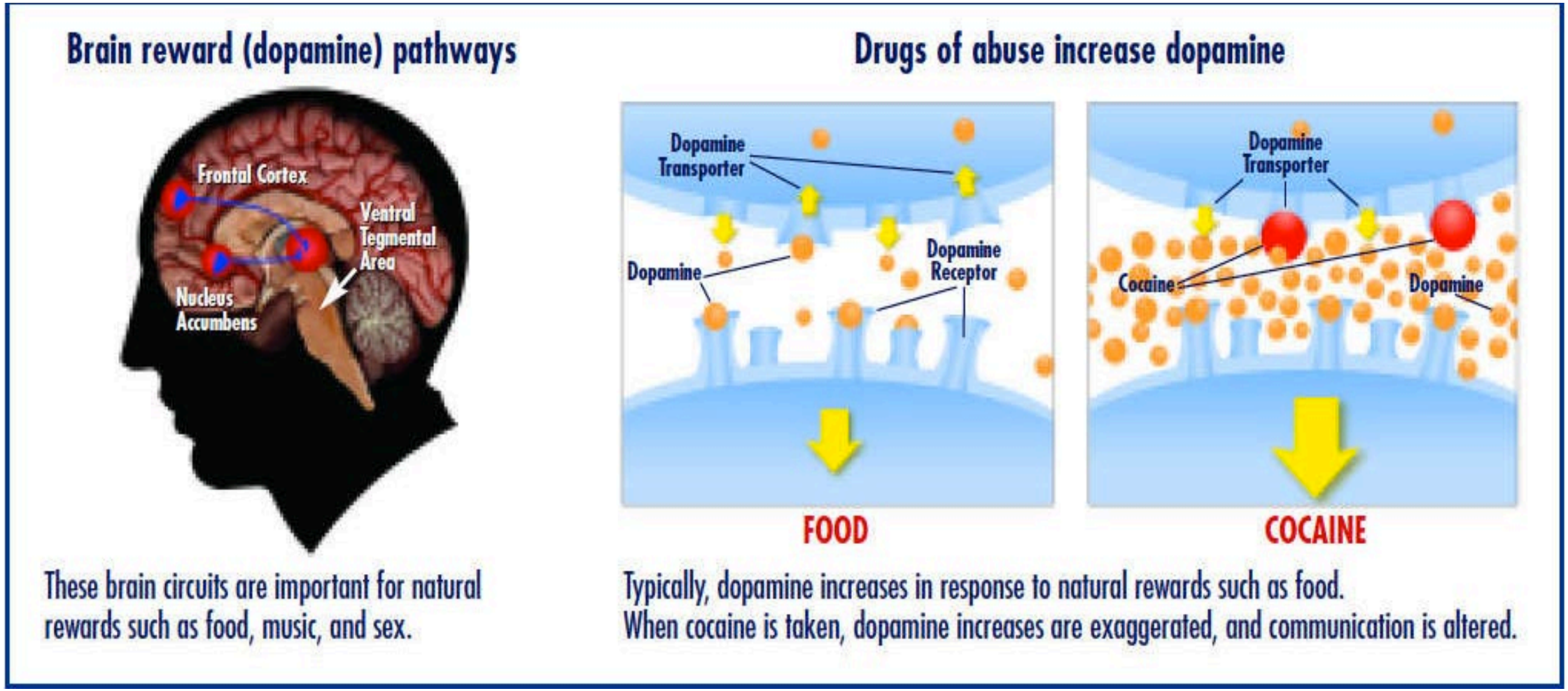
Objectives

The participant will be able to:

1) Identify the challenges to recovery from substance use disorders (SUD).
2) Differentiate the rationale and methods for Contingency Management (CM).
3) Distinguish the various applications of CM to SUD treatment.
4) Refute common critiques of CM.
5) Describe the evidence supporting the effectiveness of CM in the treatment of SUD.

The Challenge of Recovery From SUD

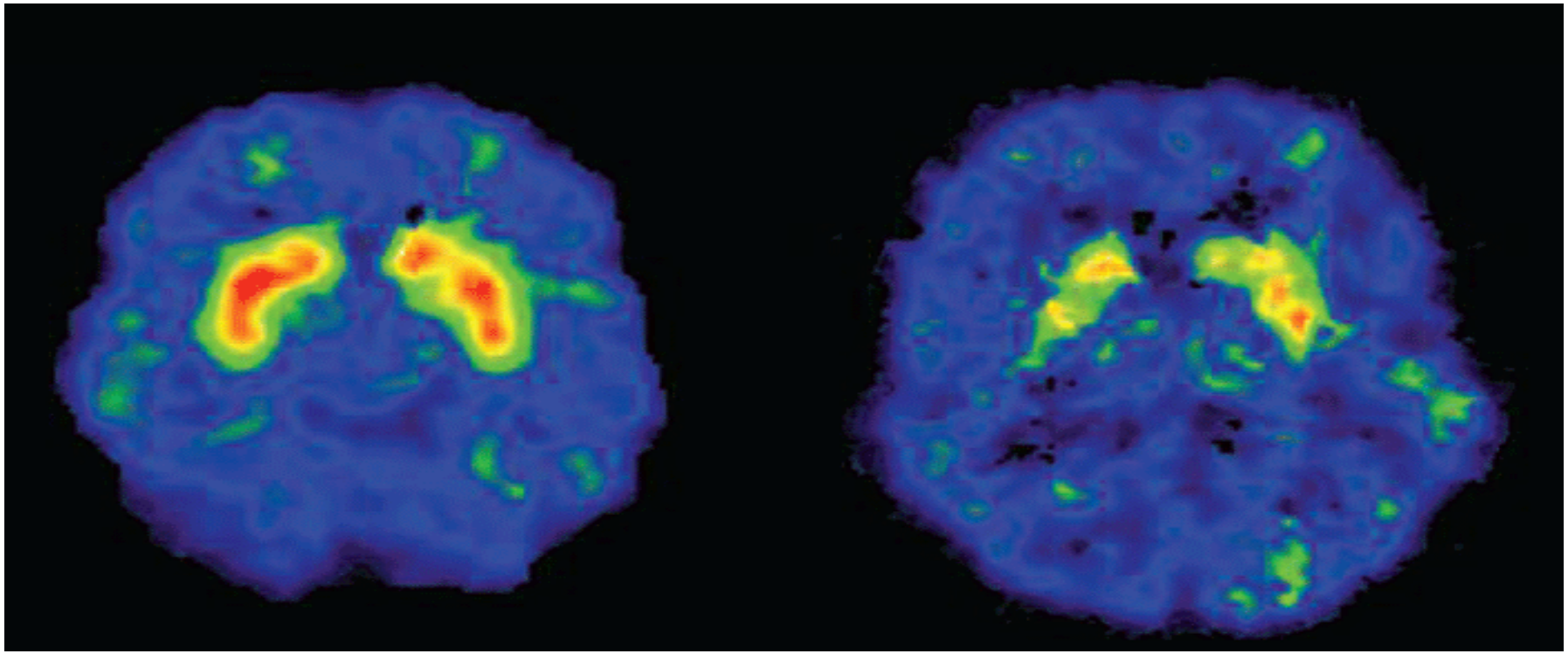
Recovery from SUD:
The Neurophysiological Challenge



https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drugs-brain

Volkow and Li-2005-Nature Rev Neuroscience

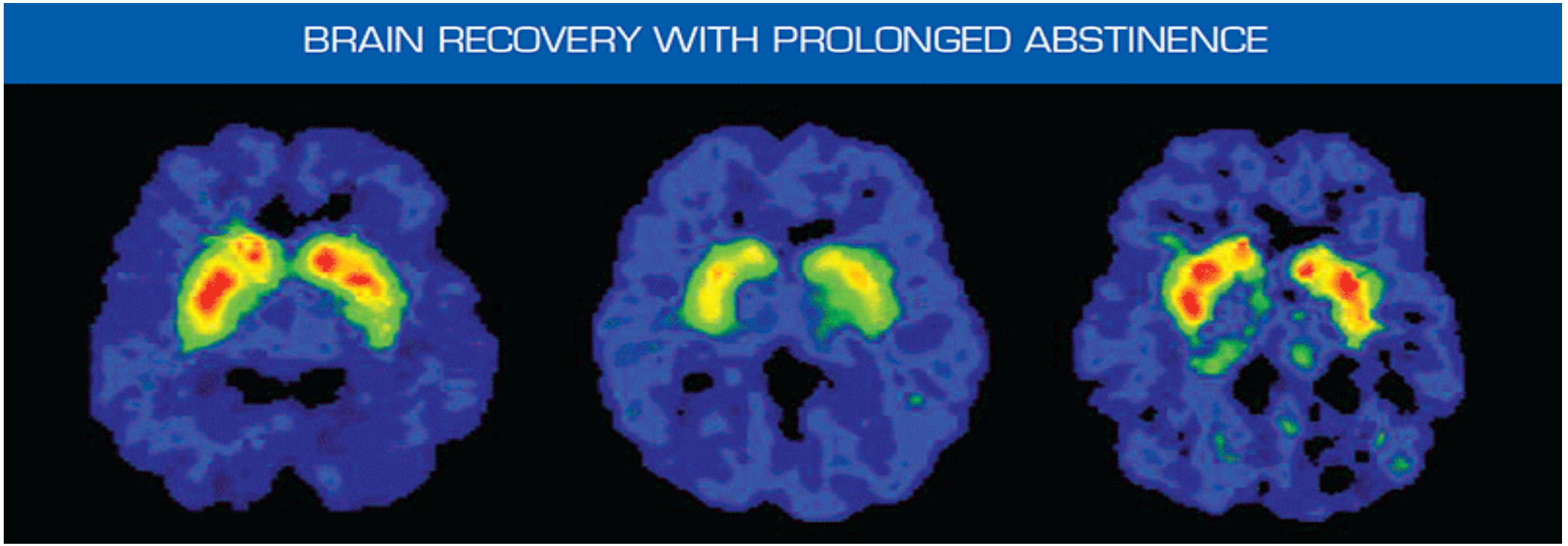
Recovery from SUD:
The Neurophysiological Challenge



Healthy Control **Stimulant Use Disorder**

https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drugs-brain

Recovery from SUD: The Time Challenge



Healthy Control	One month abstinent from Methamphetamine	14 months abstinent from Methamphetamine

https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/treatment-recovery

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).

The Bulletin revolving door patients - Bing images

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.**

angel and devil on shoulder clipart - Clip Art Library (clipart-library.com)

Methamphetamine Use Disorder: An Exemplar of the SUD Recovery Challenge

Effects of Methamphetamine: Immediate Reinforcement, Delayed Punishment

Short-term Effects May Include:

- Increased attention and decreased fatigue
- Increased activity and wakefulness
- Decreased appetite
- Euphoria and rush
- Increased respiration
- Rapid/irregular heartbeat
- Hyperthermia

Short-term Effects May Include:

- Addiction
- Psychosis, including paranoia, hallucinations, repetitive motor activity
- Changes in brain structure and function
- Deficits in thinking and motor skills
- Increased distractibility
- Memory loss
- Aggressive or violent behavior
- Mood disturbances
- Severe dental problems
- Weight loss

National Institute on Drug Abuse (NIDA), Methamphetamine https:///www.drugabuse.gov

Contingency Management Meets the Challenges

CM Makes Early Recovery Rewarding

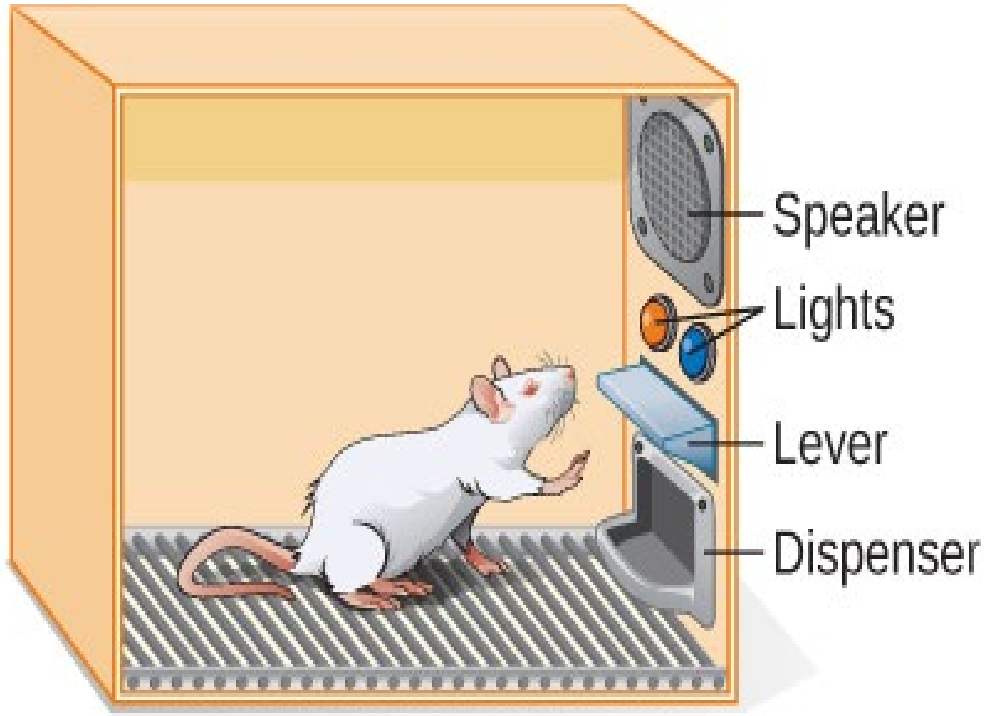
- CM brings immediate, reliable reinforcement for engaging in recovery-supportive behaviors, e.g. abstaining from substances, recovery activities, or medication adherence.

- CM engages patients in treatment and gives their brains a chance to heal.

- Reinforcing the target behavior provides de facto reinforcement of retention.

The Organizing Principle of Contingency Management: Operant Conditioning

(a)

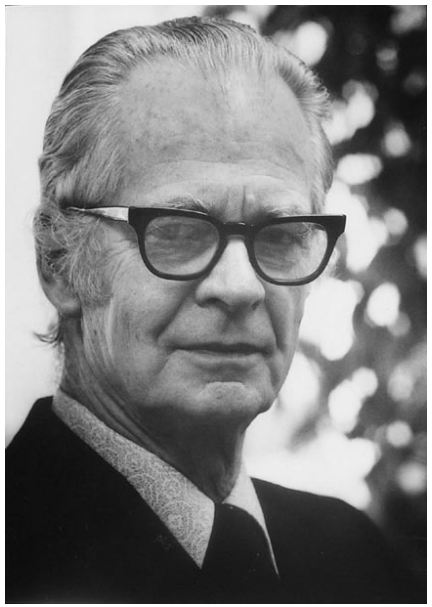


(b)

https://psyc1100.pressbooks.com/chapter/operant-conditioning/

That sounds easy enough… We reward patients for healthy behavior, right?

- Yes and No.
  - Yes, the concept is simple!
  - No, how one conducts CM makes all the difference in the world!



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

-- B.F. Skinner

How does CM work?

- Select a specific, objective target behavior, e.g. abstinence.
- Measure the target behavior objectively and frequently.
- Provide immediate, tangible, desirable reinforcement when the target behavior occurs.
- Escalate the size of the reinforcement for consistent behavior.
- Withhold reinforcement when the target behavior does not occur.
- Re-set the size of the reinforcement for the next occurrence of the target behavior.

What Behaviors to Reinforce

- Any volitional behavior can be a target of CM.
- Defining and monitoring the behavior to support immediate provision or withholding of reinforcement is crucial.
- The target behavior must be one the patient can successfully perform.
- In SUD treatment, two recovery behaviors, abstinence and treatment attendance, can be monitored reliably, validly, objectively, and frequently.
- Other behaviors like medication adherence are appropriate targets of CM, but monitoring these behaviors can be more complicated.
- Recovery activities also are appropriate CM targets provided they can be verified objectively and frequently.

Implementation Concerns: Procedural

- Evidence-based CM protocol: Voucher or Prize?

- Target Drug (Why not total abstinence?)
  - Most commonly stimulants, sometimes cannabis, soon alcohol?
  - Opioids? Medication for opioid use disorder (MOUD) remains the most effective, front-line treatment.

- Measuring abstinence? Toxicology testing with immediate results.

- Who administers CM?

Implementation Concerns: Procedural

- Type of reward?
- 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.

Implementation Concerns: Organizational

- Implementing point-of-care drug testing
- Changing the clinical culture
- Training and Coaching
- Telehealth-administered CM

Common, Understandable, Refutable, Criticisms of CM

CM is Bribery

- One common critique against CM is that it is a form of bribery.
- However, CM does not even meet the definition of bribery let alone serve as an example of it.
- A bribe is typically the provision of a financial or otherwise material incentive to induce the recipient to behave in a manner (unethically and/or illegally) that benefits the payor (and can put both the payor and payee at risk).
- In the case of CM, the patient receives a reinforcer to strengthen a behavior, e.g. abstinence, that is in his/her own best interest, e.g. recovery from SUD.
- Furthermore, CM is an evidence-based treatment for SUD which can be a fatal illness.
- Withholding a life-saving treatment can be considered unethical and immoral.

CM is Paying People to Do What They Ought To Do

- We shouldn't "pay" people to do what they ought to be doing.
- As with the bribery critique, this critique is not even definitionally sound.
- When one "pays" another, the payor is compensating the payee for performing a behavior in the best interest of the payor.
- In CM, we reinforce the patient's behavior that is in the patient's best interest to perform, e.g. being abstinent.
- Furthermore, managed reinforcement contingencies are how we all learn.

CM Diminishes Internal Motivation for Recovery

- There is evidence that reinforcing high-interest, automatically-reinforcing behaviors, e.g. like solving puzzles, can diminish internal motivation – a concept known as the Overjustification Effect (Lepper et al., 1973, *JPSP*, *28*(1), 129-137).

- However, the overwhelming majority of evidence on the effect of external reinforcement of behaviors like recovery from SUD has found that it does NOT reduce internal motivation (Promberger et al., 2013, *Health Psychology*, *32*(9), 950-957; Litt et al., 2008, *Addiction*, *103*(4), 638-648; Ledgerwood and Petry, 2006, *DAD*, *83*, 65-72; Budney et al., 2000, *JCCP*, *74*, 307-316; Eisenberg and Cameron, 1996, *Am Psychologist*, *51*(11), 1153-1166).

- Recent evidence of the enduring benefits of CM come from a meta-analysis of 23 randomized trials of CM, with 25 or more participants in each condition, that included objective indices of drug use outcomes, and were published in any year through July 2020 (Ginley et al, 2021, *JCCP*, *89*(1), 58-71).
  - 22% greater likelihood of abstinence at a median of 24 weeks post-treatment.
  - CM effects on abstinence were evident as long as 1 year after reinforcers have been discontinued.

CM Effect Stops When You Stop CM

- Since SUD is a chronic illness and chronic illness symptoms can return when treatment ends, another critique of CM is that substance use behaviors will re-emerge when the CM ends.
- While this is possible, the aforementioned 2021 meta-analysis by Ginley and colleagues suggests that CM effects can endure rather than end when the CM ends.
- Furthermore, CM is among the most effective treatments for promoting lengthier periods of abstinence during treatment; and, we know that the longer the duration of abstinence during treatment, the greater the likelihood of long-term abstinence following treatment (Higgins, Badger, et al., 2000; Petry, Alessi et al., 2005; Petry, Martin, et al., 2005; Petry, Peirce, et al, 2005; Petry et al, 2007).
- CM reinforces the patient's efforts at living without the target substance and the longer that period, the greater the likelihood that the patient will begin to experience reinforcements aside from CM to sustain the recovery behavior.

Abstinence vs Harm Reduction

- CM can be perceived as an Abstinence-Only approach to treatment and thus incompatible with Harm Reduction.
- However, the target behavior to be reinforced need not be abstinence (though that yields the strongest CM effect).
- Moreover, even when the target is abstinence, CM is consistent with a Harm Reduction approach because:
  - It helps shape abstinence.
  - It rewards the patient for testing negative for the target substance (not for committing to an abstinence goal).
  - The only penalty for not completing the target behavior is withholding and resetting reinforcement, not expulsion from treatment or other aversive consequences.

Incentives Will Be Diverted to Support Substance Use

- CM involves the provision of items of value to patients with SUD, so it is possible that the patients will exchange or sell the incentives to support substance use.
- However, Festinger and colleagues (2014, *JSAT*, *47*(2), 168-174) found that even when awarded cash, CM patients show no increase in substance use compared to CM patients who receive non-cash incentives.
- Because the patient who uses the target substance (testing positive) will not receive reinforcement and would have their reinforcement amount reset, CM mitigates the risk of diversion.
- In VA, the incentives that Veterans earn in CM come in the form of coupons that can be used to purchase goods from the Veterans Canteen Service (VCS; which operates the cafeterias, coffee shops, and retail stores (canteens) throughout VA. VCS offers a wide range of merchandise; but, it does not sell items that might complicate recovery from SUD, e.g. tobacco products, alcoholic beverages, and gambling items.
- All that said, maintaining the security and accounting of incentives is absolutely necessary.
- Furthermore, maintaining integrity of the urine drug testing regime, adherence to proper CM procedures, and rigorous documentation of CM clinical practices will further mitigate any risk of diversion of incentives.

Implementing CM: Is the Juice Worth the Squeeze?

Abstinence CM Outcomes: The Empirical Literature

- **Meta-analysis of 47 CM studies** with treatment/control group design published between 1970-2002 (Prendergast et al., *Addiction,* 2006).
  - **Mean effect size =.42 (22% improvement in success rate).**
  - **"Among the more effective approaches to promoting abstinence during the treatment of substance use disorders."**

- **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 (Dutra et al., *American Journal of Psychiatry,* 2008).
  - **Mean CM effect size =.58 (28% improvement in success rate).**
  - **"The strongest effect was found for contingency management interventions."**

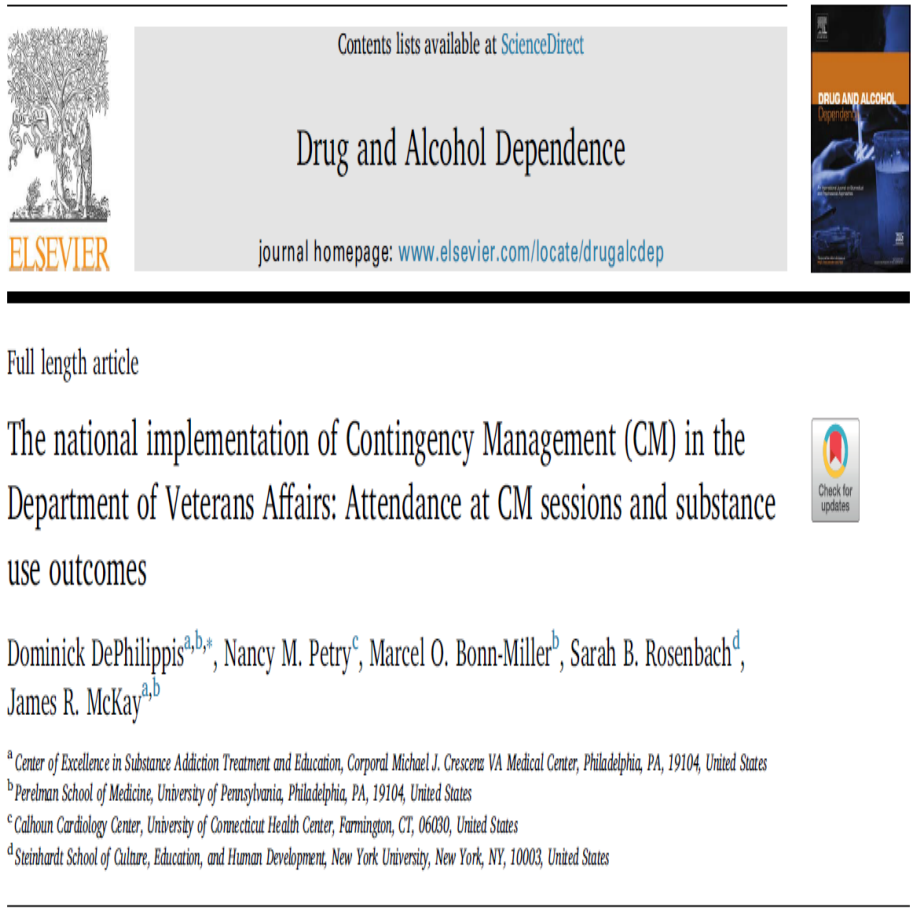
Abstinence CM Outcomes: The Empirical Literature

- **Systematic review of 27 studies of CM that targeted methamphetamine abstinence** (Brown and DeFulio, *Drug and Alcohol Dependence*, 2020).
  - **"CM is broadly effective in reducing methamphetamine use and promoting attendance to recovery-related appointments in people with methamphetamine use disorders and appears to produce broad beneficial effects beyond the behaviors targeted for intervention."**

- **Meta-analysis of 157 studies of treatments for active cocaine use among adults**; >400 treatment groups & >15K participants were included. (Bentzley et al., *JAMA Network Open*, 2021).
  - **"Only CM programs were significantly associated with an increased likelihood of having a negative test result** for the presence of cocaine (OR, 2.13; 95%CI, 1.62-2.80), and this association remained significant in all sensitivity analyses."

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

- **Patient Enrollment in CM**
  - From June 2011 to December 2015, VA provided CM to 2,060 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.



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Full length article

The national implementation of Contingency Management (CM) in the Department of Veterans Affairs: Attendance at CM sessions and substance use outcomes

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DePhilippis, D., Petry, N.M., Bonn-Miller, M.O., Rosenbach, S.B., McKay, J.R. (2018). The national implementation of Contingency Management (CM) in the Department of Veterans Affairs: Attendance at CM sessions and substance use outcomes. Drug and Alcohol Dependence, 185, 367-373. doi: 10.1016/j.drugalcdep.2017.12.020

VA's Abstinence CM Implementation: Outcomes Through FY23

- 120 VA stations have made CM reinforcing abstinence available to Veterans pursuing recovery from substance use disorder.
- Over 6,400 Veterans have received Abstinence CM, and 92% of the >83,000 urine samples have tested negative for the target drug(s), e.g. stimulants or cannabis!
- Regarding retention, the number of samples provided (83,718) divided by the number of Veterans who've received CM (6,468) is ~13 samples. Since CM involves twice-weekly sampling, the mean retention in treatment among CM patients is ~6.5 weeks.

CM is Effective Across Many Patient Populations

- **Homeless:**
  - Tracy et al., 2007, *Am J Drug Alcohol Abuse*, *33*(2), 253-258.
- **People with serious mental illness:**
  - Murphy et al., 2015, *DAD*, *153*, 293-299.
- **People with PTSD:**
  - Mancino et al., 2010, *Am J Addict*, *19*(2), 169-177.
- **People with HIV disease:**
  - Petry et al., 2001, *JSAT*, *21*(2), 89-96.
- **Justice involved patients:**
  - DeFulio et al., 2013, *JSAT*, *45*(1), 70-75.
- **Veterans:**
  - DePhilippis et al., 2018, *DAD*, *185*, 367-373.
- **People on MOUD:**
  - Bolivar et al., 2021, *JAMA Psychiatry, 78*(10), 1092–1102.
  - Ainscough et al., 2017, *DAD, Sep 1;178,* 318-339.
- **Across ages:**
  - Weiss and Petry, 2011, *Exp Clin Psychopharmacol*, *19*(2), 173-181.
- **Across races*:**
  - Montgomery et al., 2015, *JCCP*, *83*(3), 473-481.
- **Across sexes:**
  - Petry and Rash, 2015, *Exp Clin Psychopharmacol*, *23*(5), 369-376.
- **Pregnant women:**
  - Schottenfeld et al., 2011, *DAD*, *118*(1), 48-55.
- **LGBT community:**
  - Reback et al., 2021, *AIDS and behavior*, *25*(Suppl 1), 40–51.
  - Zajac et al., 2020, *PAB*, 34(1), 128-135.
- **Across income levels:**
  - Rash et al., 2009, *DAD*, *104*(3), 249-253.

Why implement CM?
For at least 6 reasons…

1) **It's needed and it works!**
2) **It's not limited to providers from particular disciplines!**
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!