STRATEGIES TO ADDRESS COCAINE AND METHAMPHETAMINE USE

https://theactionalliance.org

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Strategies to Address Cocaine and Methamphetamine Use

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Epidemiology

Types of Stimulant Drugs: Cocaine Products

- Approximately 16-21 million users worldwide
- Cocaine Powder (sniffed, injected, smoked)
- “Crack” (smoked)

Major regions of use:

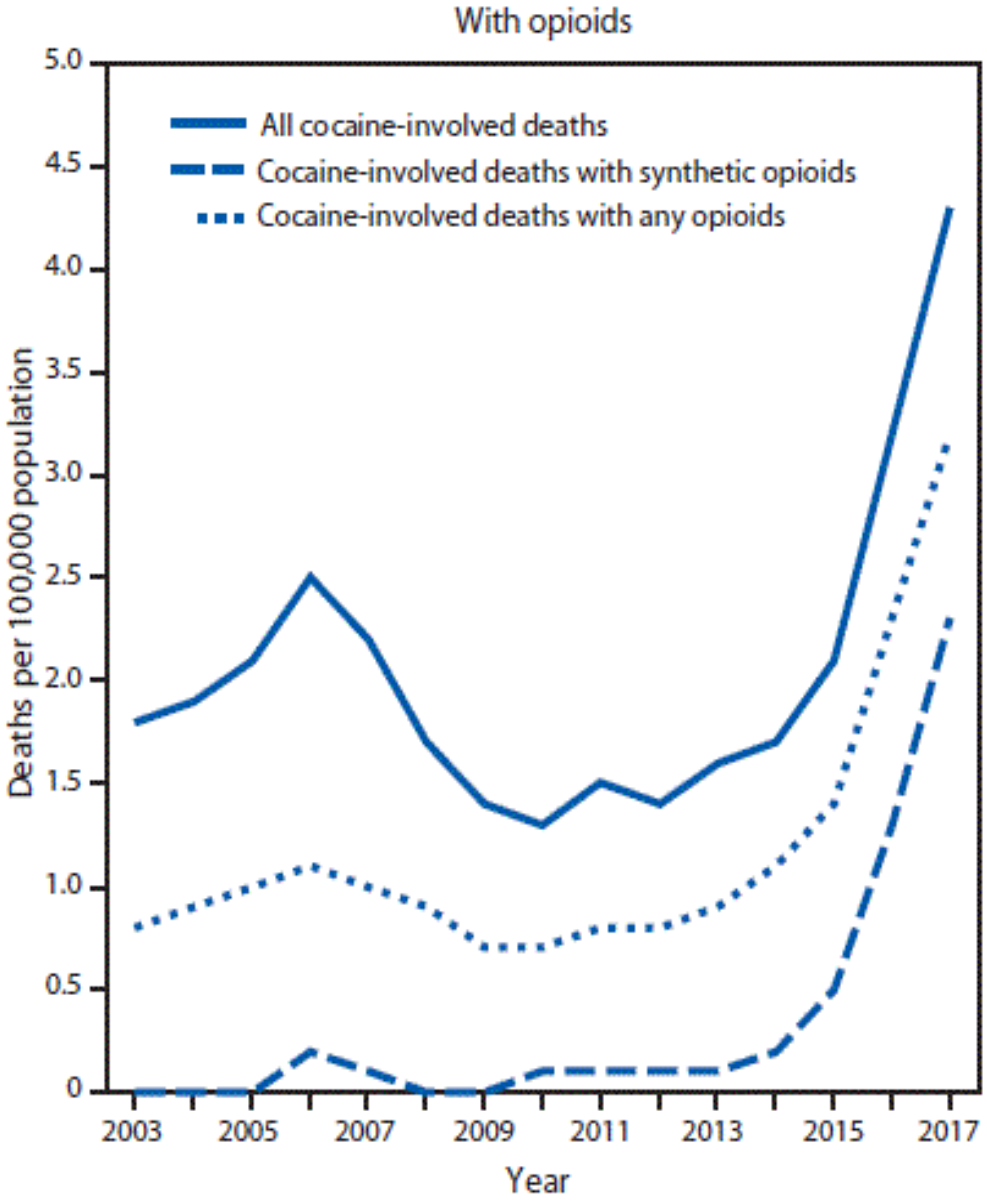
  - South America
  - North America (predominantly major urban centers disproportionately impacts African American community)
  - Increases in Central and Western Europe
  - Increases in South and Western Africa

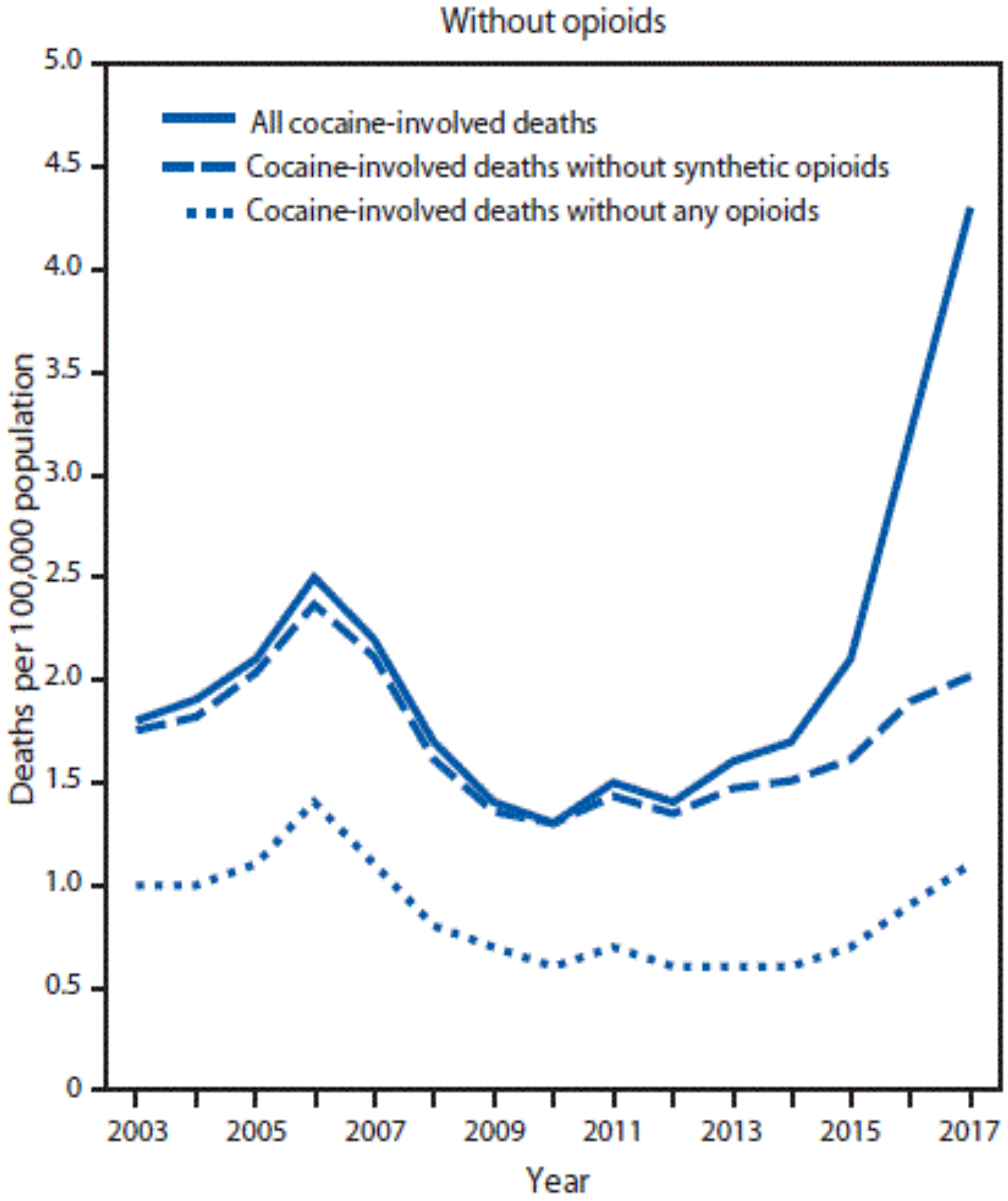
Types of Stimulant Drugs

Amphetamine Type Stimulants (ATS)

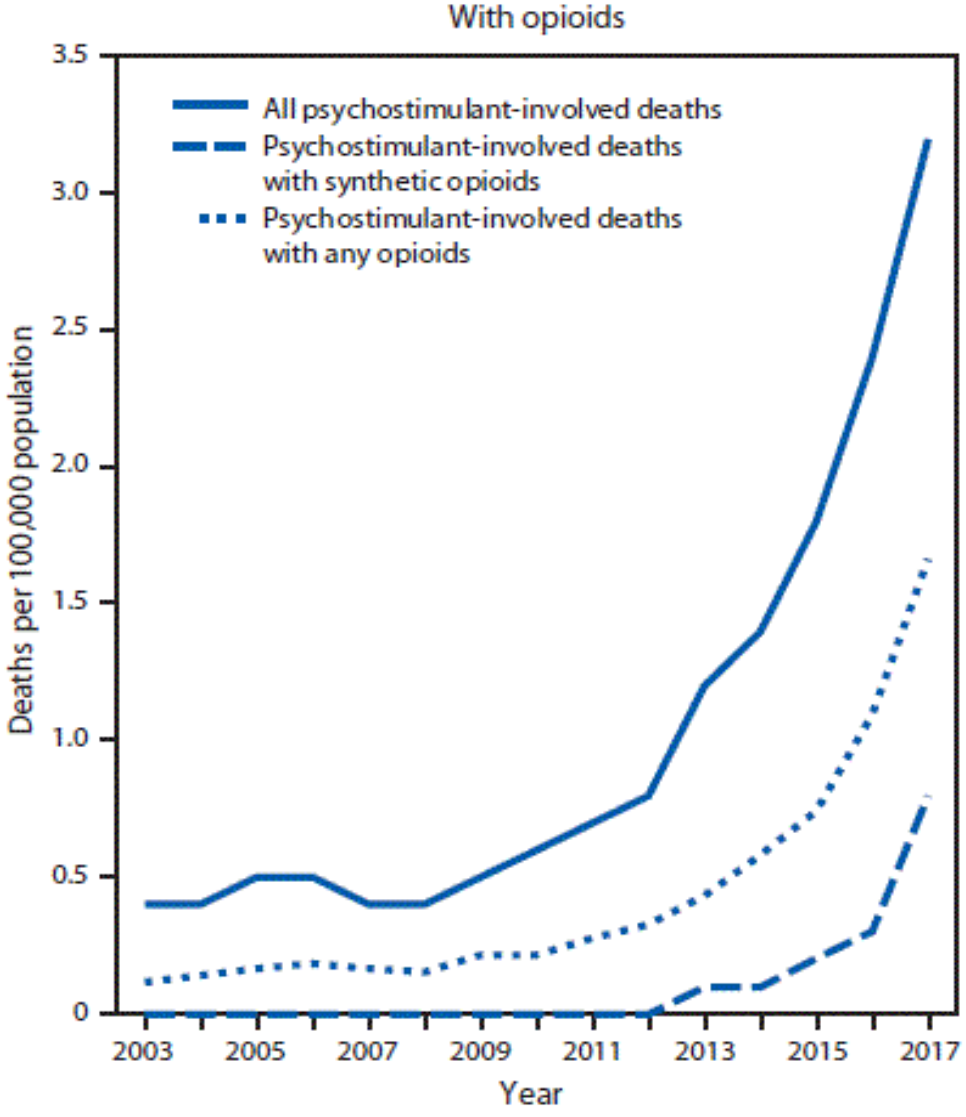
- Approximately 40-60 million users worldwide
- Methamphetamine
  - Powder: inhaled, smoked, injected
  - Crystal/Ice: smoked
  - Tablets: orally, crushed and inhaled, smoked, injected (e.g., Captagon)
- Amphetamine
  - Powder, Tablets, Liquid: orally, injected, smoked
- Major regions of use:
  - Eastern and SE Asia
  - Australia and Oceania
  - North America
  - Increases in Central, Eastern and Northern Europe
  - Increases in Middle East
  - Increases in South Africa

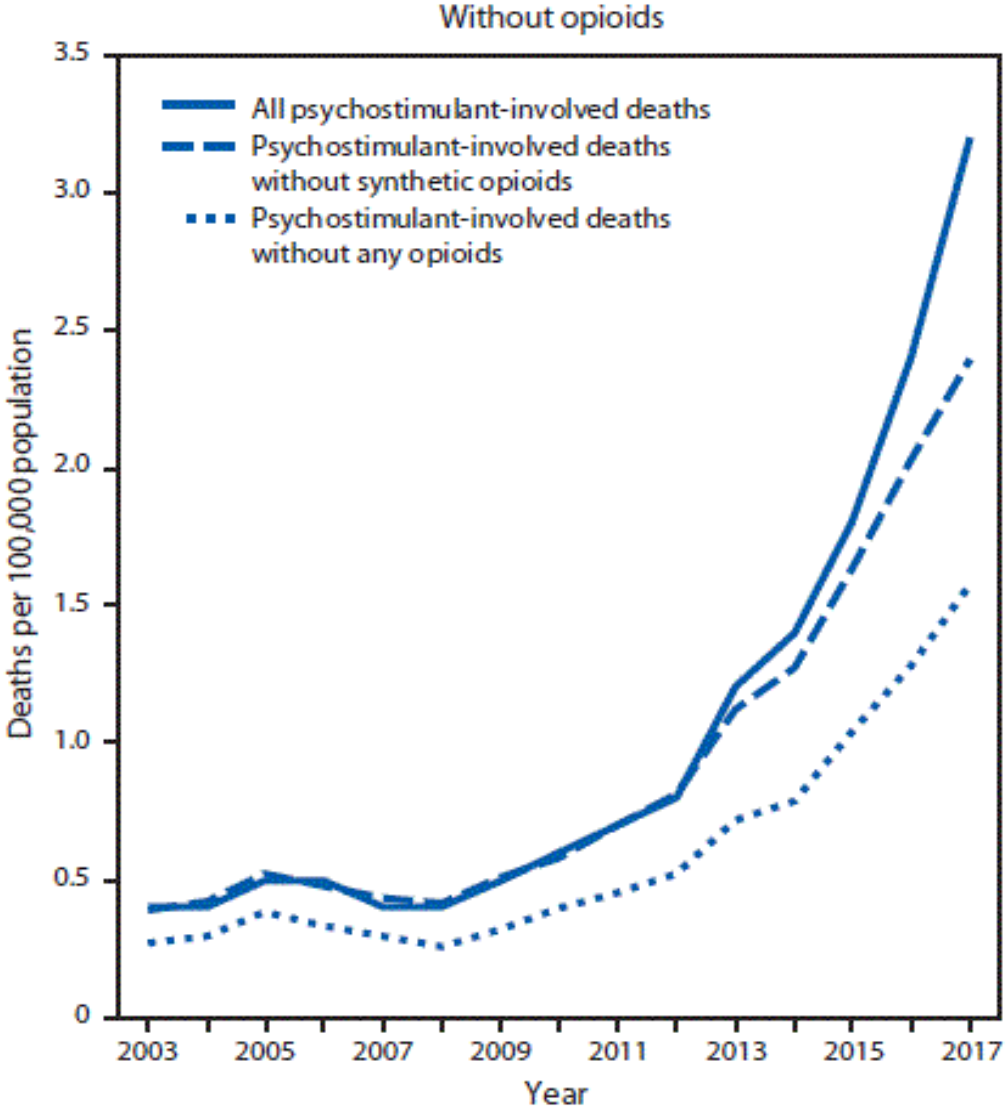
Cocaine-related deaths 2003-2017





ATS-related deaths 2003-2017





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Twin Epidemics: The surging rise of methamphetamine use in chronic opioid users.

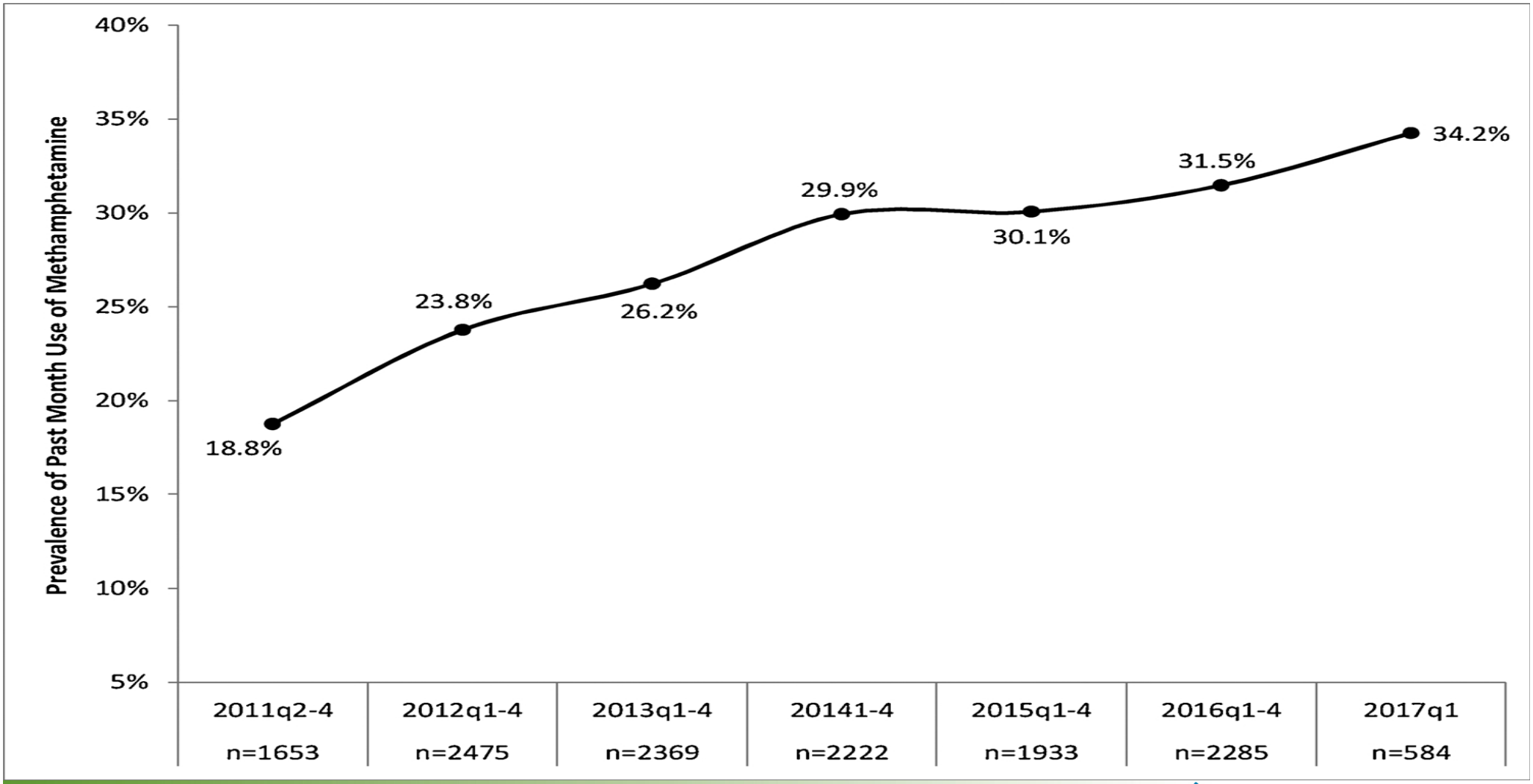
Ellis, M. Kasper, A., Cicero, T. (2018)

Drug and Alcohol Dependence, 2018, 14-20

Past month use of methamphetamine significantly increased among treatment-seeking opioid users (+82.6%, $p < .001$), from 18.8% in 2011 to 34.2% in 2017.

% of Respondents reporting use of meth in past 30 days

Ellis et al 2018



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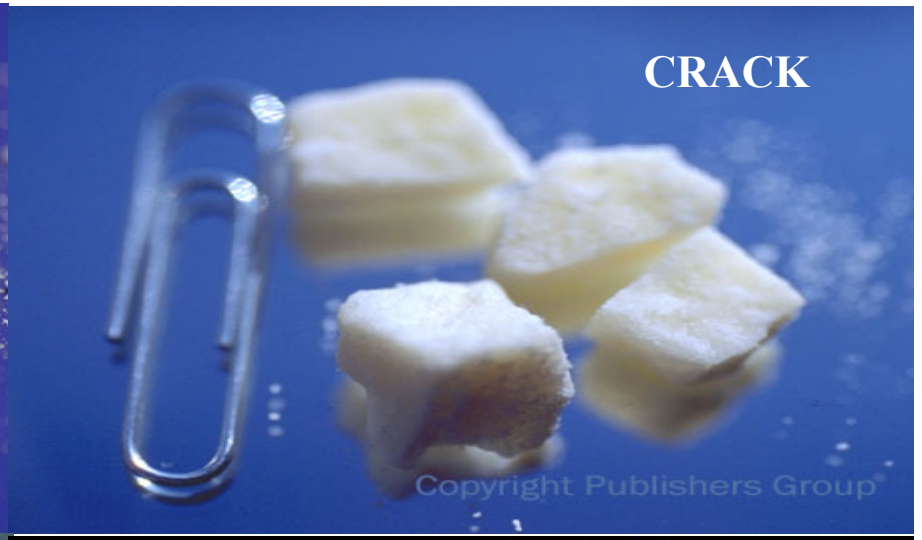
Cocaine and Methamphetamine Neurobiology



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Cocaine vs Methamphetamine

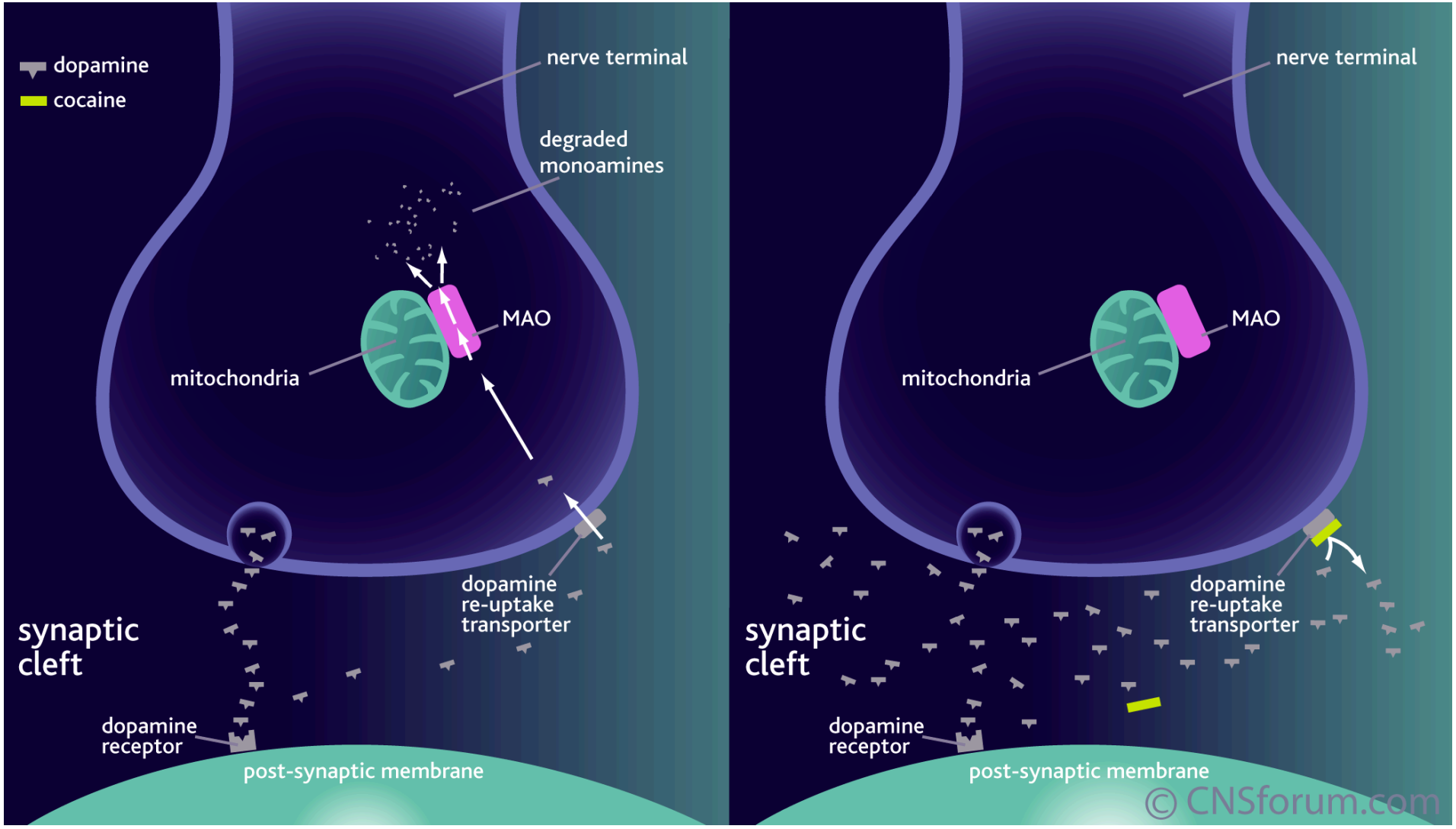
Cocaine

- plant-derived
- high lasts 20-30 minutes
- T ½: 1 hour
- mechanism: mainly DA reuptake
- used medically
- not directly neurotoxic

Methamphetamine

- synthetic
- high lasts 8-24 hours
- T ½: 12 hours
- mechanism: mainly DA release
- medical use less common (Rx as Desoxyn)
- Greater neurotoxicity in commonly used doses

Cocaine Neurobiology



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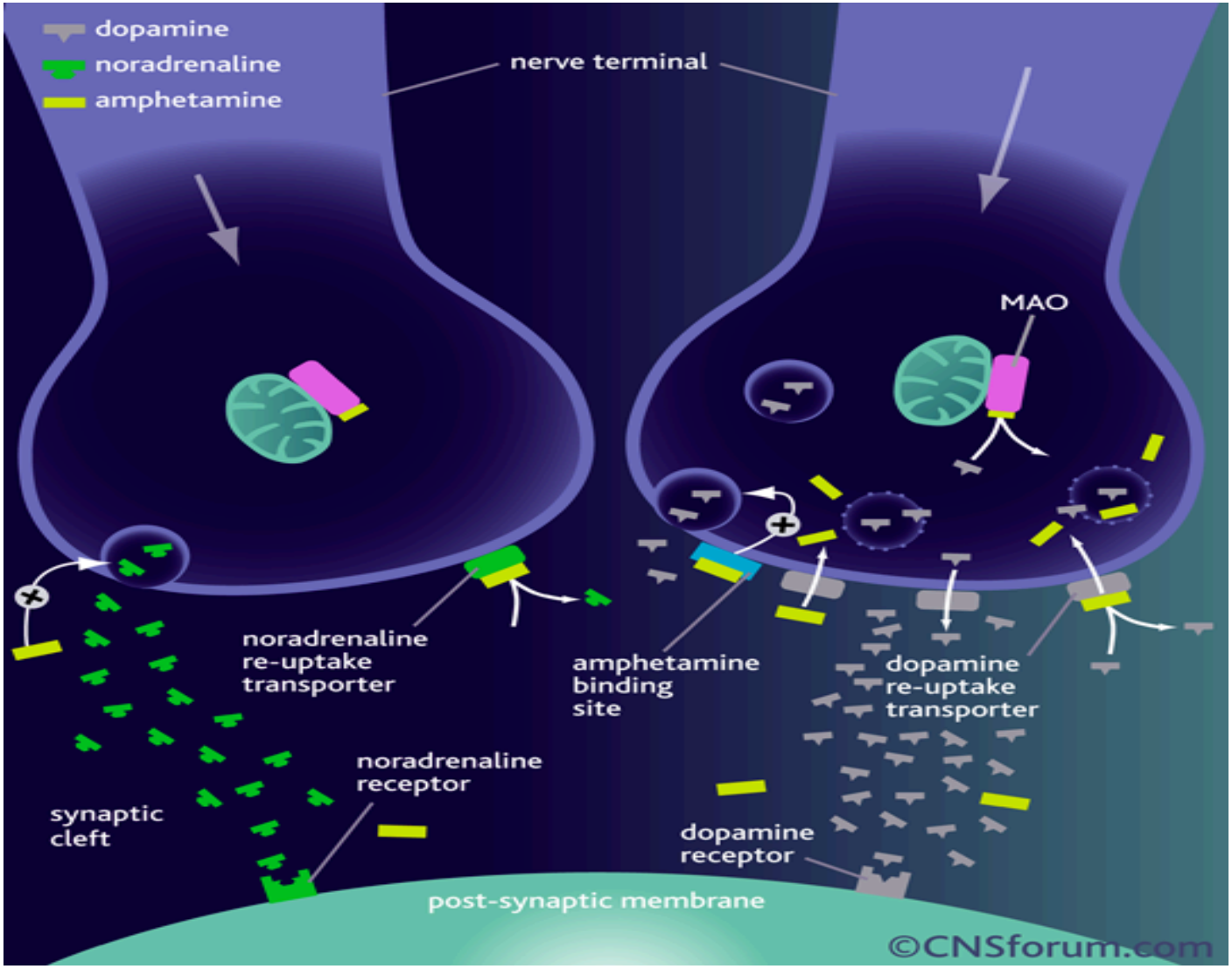
Methamphetamine Neurobiology



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Clinical Challenges

Clinical Challenges with Stimulant Dependent Individuals

- Limited understanding of stimulant addiction
- Ambivalence about need to stop use
- Impulsivity/Poor judgement
- Cognitive impairment and poor memory
- Anhedonia
- Powerful Pavlovian trigger-craving response
- **Very poor retention in outpatient treatment**
- Elevated rates of psychiatric co-morbidity

Special Treatment Consideration Should Be Made for the Following Groups

- Injection users
- Users who take stimulants daily or in very high doses.
- Homeless, chronically mentally ill and/or individuals with high levels of psychiatric symptoms at admission.
- Men who have sex with men (MSM)
- Users under the age of 21.
- **Individuals in medication treatment for OUD**

Do Methamphetamine Users Respond Differently to Treatment than Cocaine Users?

Response to Behavioral Treatments: Cocaine vs Meth

- In published research studies where treatment response to behavioral treatments have been compared with cocaine users vs meth users, there has been no evidence of differential response.

- Matrix Model Huber, Ling and Rawson, 1997
- Contingency Management. Roll et al, 2006
- Community Treatments. Copeland and Sorenson, 2001
- Community Treatments. Luchansky, Krupski and Stark, 2001

Treatment for Individuals with Stimulant Dependence

Meta-analysis of Treatment Efficacy for Individuals with Stimulant Use Disorders

Citation: De Crescenzo F, Ciabattini M, D'Alò GL, De Giorgi R, Del Giovane C, Cassar C, et al. (2018) *Comparative efficacy and acceptability of psychosocial interventions for individuals with cocaine and amphetamine addiction: A systematic review and network meta-analysis.* PLoS Med 15(12): e1002715. ttps://doi.org/10.1371/journal. pmed.1002715

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Meta-Analysis Findings

Network meta-analysis was used to analyze 50 clinical studies (6,943 participants) on 12 different psychosocial interventions for cocaine and/or amphetamine addiction.

The combination of 2 different psychosocial interventions, namely **contingency management and community reinforcement approach, was the most efficacious and most acceptable treatment both in the short and long term.**

Psychosocial Interventions for Cocaine and Psychostimulant Amphetamines Related Disorders.

Werner Paulo Knapp, Bernardo Soares, Michael Farrell, Maurício Silva deLima. (2009) The Cochrane Collaboration.

- **Main results**

  Twenty-seven randomized controlled studies (3663 participants) fulfilled inclusion criteria and had data that could be used for at least one of the main comparisons.

- **The comparisons between different type of behavioral interventions showed results in favor of treatments with some form of contingency management in respect to both reducing dropouts and lowering cocaine use.**

Treatments for Stimulant Use Disorders (SUDs) with Empirical Support

- Contingency Management/Incentives (CM/I)
- Community Reinforcement Approach (CRA)
- Cognitive-Behavioral Therapy (CBT)
- Other approaches with interest
  - Matrix Model
  - Motivational Interviewing
  - Physical Exercise
  - Mindfulness Meditation

Contingency Management

(Also known as Motivational Incentives)

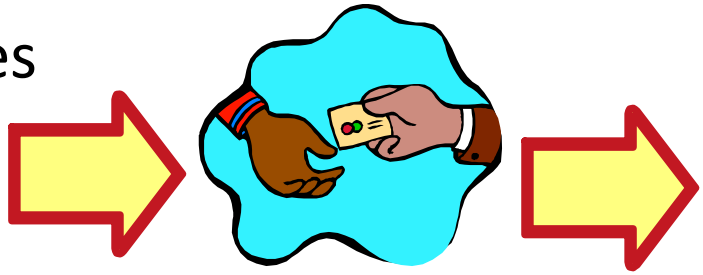
Contingency Management

A technique employing the systematic delivery of positive reinforcement for desired behaviors. In the treatment of methamphetamine dependence, vouchers or prizes can be "earned" for submission of methamphetamine-free urine samples.

How Incentives Work

Patient attends treatment,
Gives negative samples

Give Incentive



More patients
- attend treatment
- **stay drug-free**

Basic Behavioral Principles

1. Frequently monitor target behavior

2. Provide incentive when target behavior occurs

3. Remove incentive when target behavior does not occur

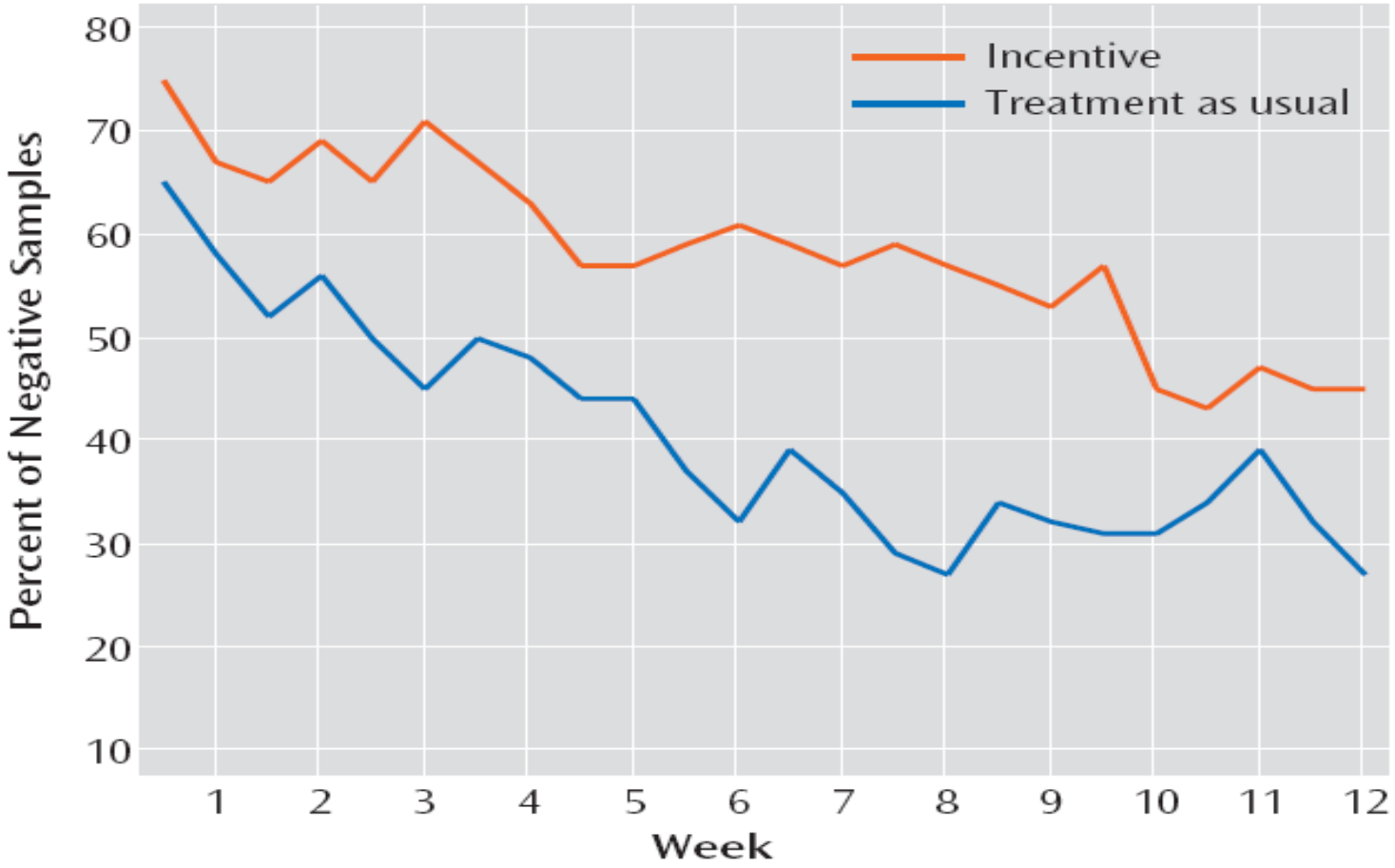
Contingency Management for the Treatment of Methamphetamine Dependence.

Roll, John, et al. American Journal of Psychiatry. 163: 1993-1999, 2006.

- **METHOD:** The authors report data on 113 participants who were diagnosed with methamphetamine abuse or dependence. They were randomly assigned to receive 12 weeks of either treatment as usual or treatment as usual plus contingency management. Urine samples were tested for illicit drugs, and breath samples were tested for alcohol. The reinforcers for drug-negative samples were plastic chips, some of which could be exchanged for prizes. The number of plastic chips drawn increased with each week of negative samples but was reset to one after a missed or positive sample.

- **RESULTS:** The participants in both groups remained in treatment for equivalent times, but those receiving contingency management in addition to usual treatment submitted significantly more negative samples, and they were abstinent for a longer period of time (5 versus 3 weeks).

Retention Rate: Roll et al 2006



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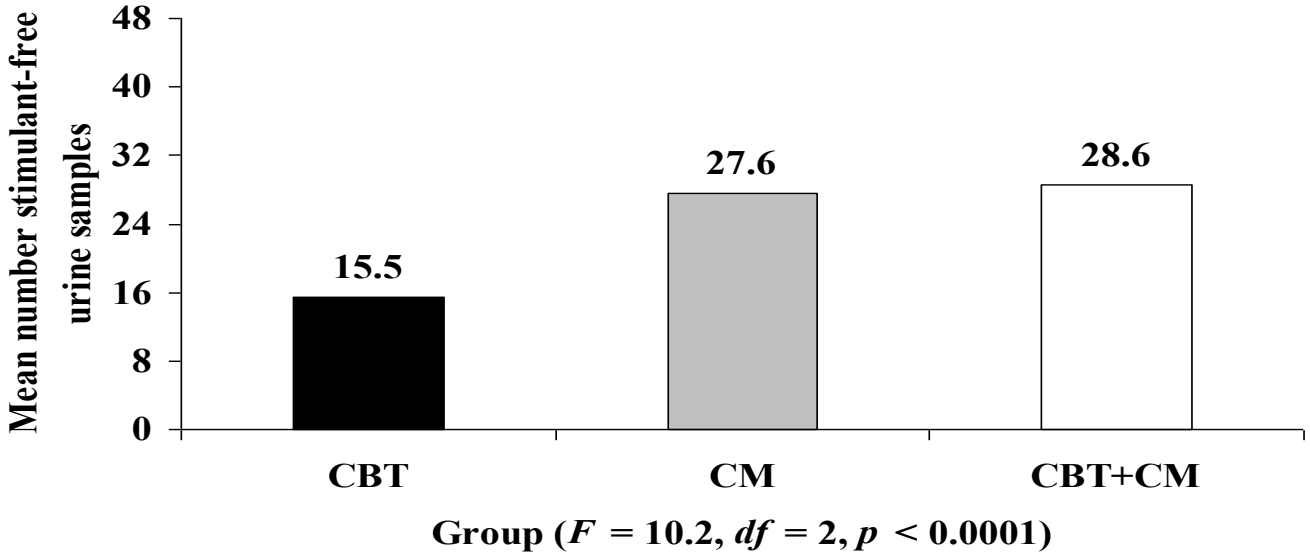
Cognitive Behavioral Therapy and Contingency Management for Stimulant Dependence.

Rawson, R. et al, Addiction, 2004,101, 267-274.

- **DESIGN:** Randomized clinical trial
- **PARTICIPANTS:** Stimulant-dependent individuals (*n* = 171)
- **INTERVENTION:** CM, CBT, or combined CM and CBT, 16-week treatment conditions. CM condition participants received vouchers for stimulant-free urine samples. CBT condition participants attended three 90-minute group sessions each week. CM procedures produced better retention and lower rates of stimulant use during the study period.
- **RESULTS: CM produced evidence of efficacy during treatment, CBT produced comparable longer-term outcomes.** There was no evidence of an additive effect when the two treatments were combined. The response of cocaine and methamphetamine users was comparable.
- **CONCLUSIONS:** This study suggests that **CM is an efficacious treatment for reducing stimulant use** and is superior during treatment to a CBT approach. CM is useful in engaging substance abusers, retaining them in treatment, and helping them achieve abstinence from stimulant use. **CBT also reduces drug use from baseline levels and produces comparable outcomes to CM on all measures at follow-up.**

Stimulant-free Uas Rawson et al 2004



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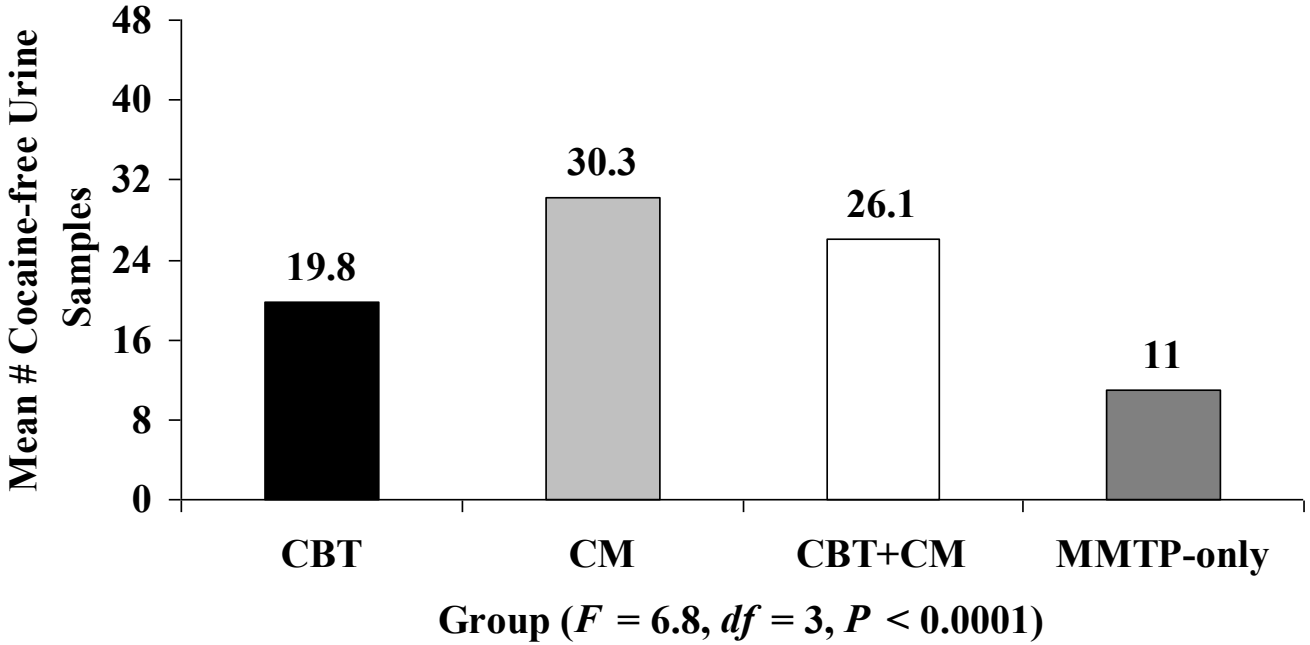
A Comparison of Contingency Management and Cognitive-Behavioral Approaches During Methadone Maintenance Treatment for Cocaine Dependence. *R. Rawson, et al. Archives of General Psychiatry 2002;59:817-824*

- **DESIGN:** Randomized clinical trial.
- **PARTICIPANTS:** Patients with cocaine dependence receiving methadone maintenance treatment (n=120).
- **INTERVENTIONS:** Participants were randomly assigned to 1 of 4 conditions: CM, CBT, combined CM and CBT or methadone treatment as usual. The active study period was 16 weeks, requiring 3 clinic visits per week.
- **RESULTS:** Urinalysis results during the 16-week treat-ment period show that participants assigned to the 2 groups featuring CM had significantly superior in treatment urinalysis results, whereas urinalysis results from participants in the CBT group were not significantly different than those from the MMTP-only group.
- **CONCLUSIONS:** Study findings during treatment provide solid evidence of efficacy for CM (with and without CBT. There was no evidence of a combined effect.

Stimulant-Free Uas Rawson et al, 2002



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Community Reinforcement Approach (CRA)

Community Reinforcement Approach

- Community Reinforcement Approach (CRA) is a combination of behavioral strategies that address the role of environmental contingencies in encouraging or discouraging drug use, and attempts to rearrange these contingencies so that a non-drug using lifestyle is more rewarding than a using one.

Components of CRA

- CRA Components include:
  - behavioral skills training
  - social and recreational counseling
  - marital therapy
  - motivational enhancement
  - job counseling
  - relapse prevention

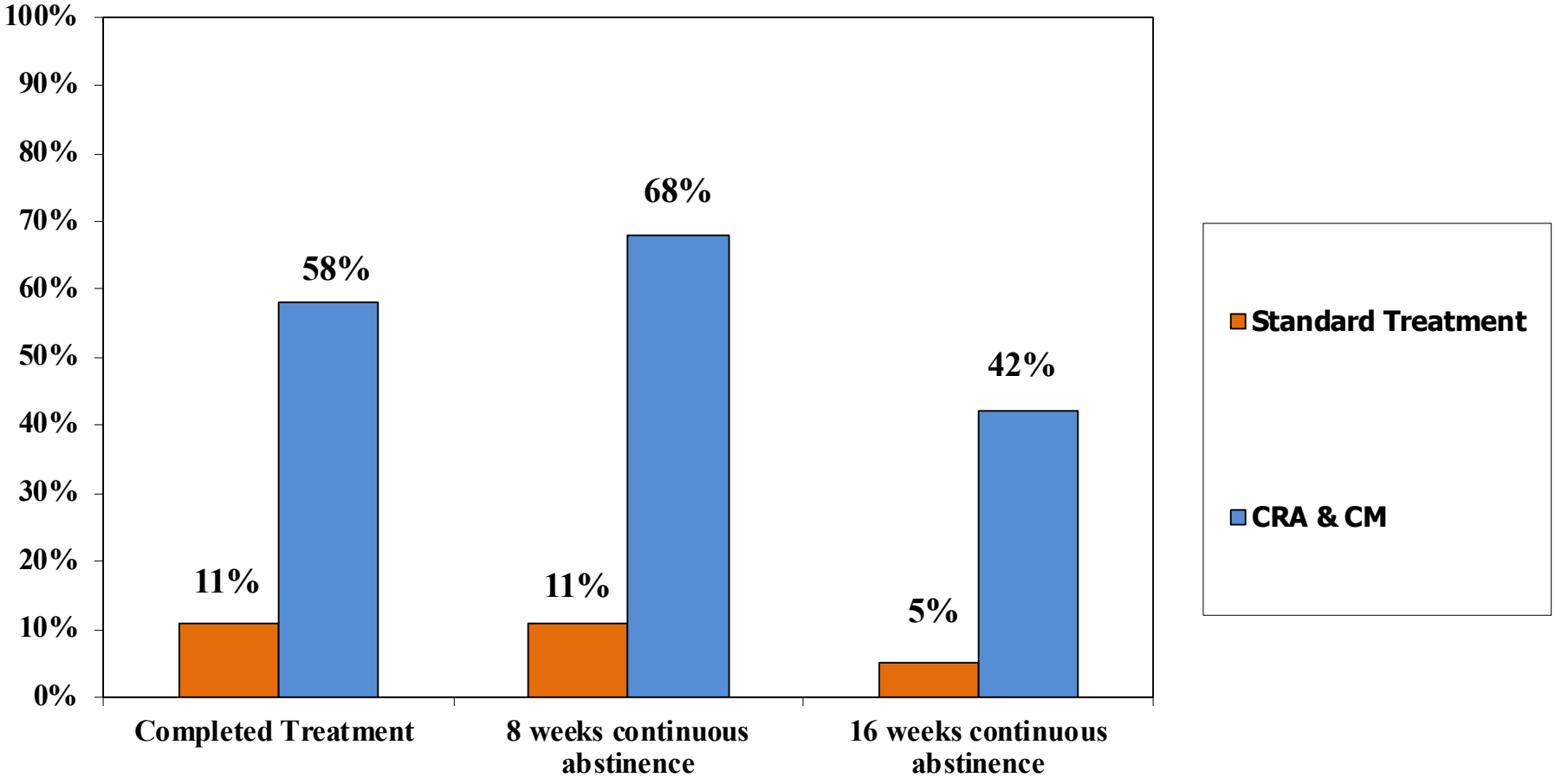
- For application to the treatment of cocaine dependence, a voucher based reinforcement program is added.

Achieving Cocaine Abstinence with a Behavioral Approach. Higgins et al. *Am J Psychiatry.* 1993; 150: 763-769

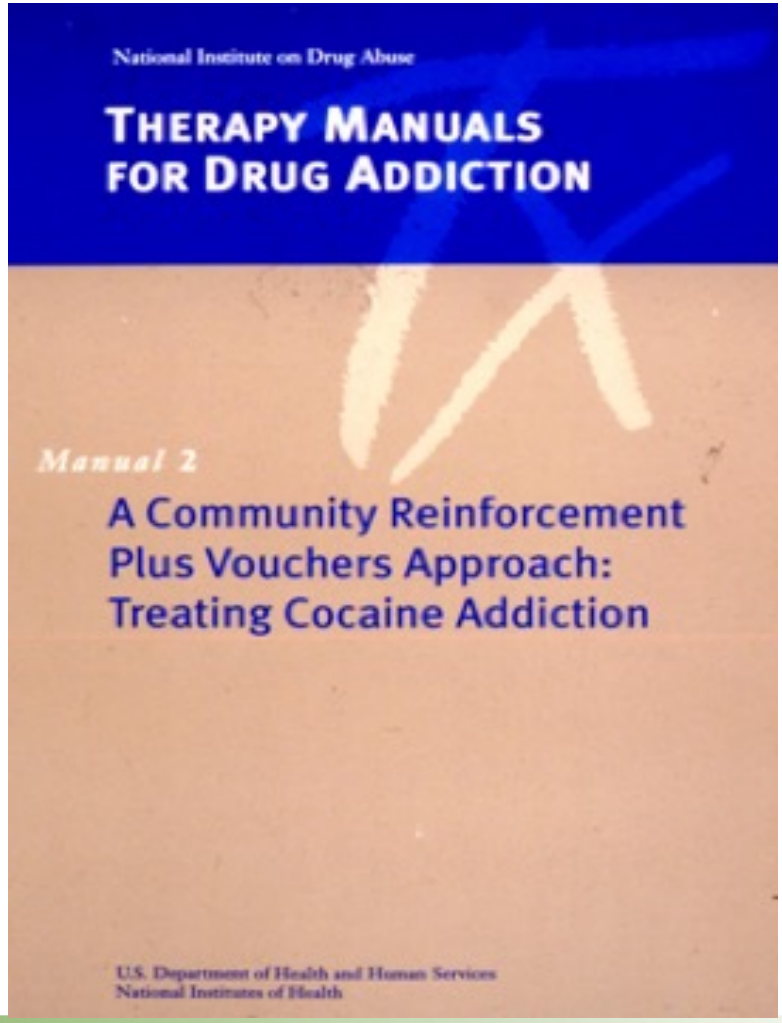
- **METHOD:** The 38 patients were enrolled in outpatient treatment and were randomly assigned to the two treatments. Counseling in the behavioral treatment was based on the community reinforcement approach, while the drug abuse counseling was based on the disease model of dependence and recovery. Patients in the behavioral, but not the drug counseling, treatment also received incentives contingent on submitting cocaine-free urine specimens.

- **RESULTS:** Of the 19 patients who received CRA, 58% completed 24 weeks of treatment, versus 11% of the patients who received counseling. In the CRA group 68% and 42% of the patients achieved at least 8 and 16 weeks of documented continuous cocaine abstinence, respectively, versus 11% and 5% in the drug abuse counseling group.

CRA and Contingency Management: Higgins et al., 1993



Resource



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Cognitive Behavioral Therapy (CBT)

Research on CBT for SUD

- Carroll, K. M., Rounsaville, B. J., Gordon, L. T., Nich, C., Jatlow, P. M., Bisighini, R. M., et al. (1994). Psychotherapy and pharmacotherapy for ambulatory cocaine abusers. *Archives of General Psychiatry, 51*, 177-197.
- Carroll, K. M., Rounsaville, B. J., Nich, C., Gordon, L. T., Wirtz, P. W., & Gawin, F. H. (1994). One year follow-up of psychotherapy and pharmacotherapy for cocaine dependence: Delayed emergence of psychotherapy effects. *Archives of General Psychiatry, 51*, 989-997.
- Carroll, K.M., Ball, S.A., Martino, S., Nich, C., Babuscio, T. A. & Rounsaville, B.J. (2009). Enduring effects of a computer-assisted training program for cognitive behavioral therapy: A six-month follow-up of CBT4CBT. *Drug and Alcohol Dependence*, 100, 178-181. PMCID: PMC2742309

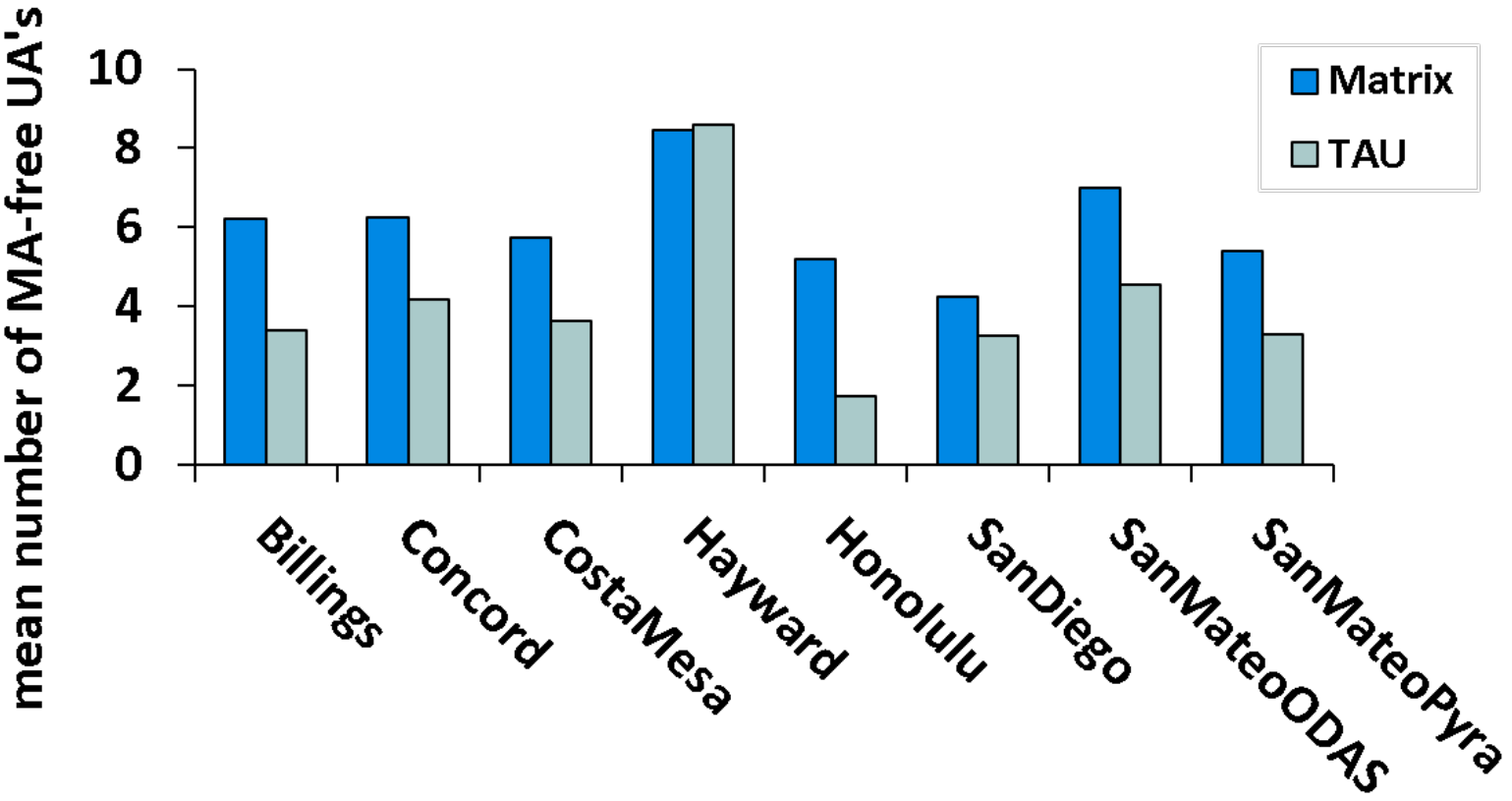
- **CBT for CBT Website: http://www.cbt4cbt.com/**

Matrix Model

Matrix Model Overview

- Is a manualized, 16-week, psychosocial approach used primarily in outpatient settings for the treatment of drug dependence.
- Manuals Can be downloaded at SAMHSA.gov
- Designed to integrate several interventions into a comprehensive approach. Elements include:
  - **Individual counseling**
  - **Cognitive behavioral therapy**
  - **Motivational interviewing**
  - **Positive reinforcement for behavior change**
  - **Family education groups**
  - **Urine testing**
  - **Participation in 12-step programs**

Mean Number of UA's That Were MA-Free During Treatment



Other Approaches with Support/Interest

- Motivational Interviewing: No direct evidence with meth users, but support with other SUDs.
- Physical Exercise: Rawson et al, 2015. Evidence of reduction of meth relapse among less severe users; enhancement of dopamine receptor recovery, reduction in depression and anxiety during early meth abstinence.
- Mindfulness Meditation: Glasner-Edwards et al 2015. Evidence of reduced anxiety and depression during early meth abstinence.

Medications for SUD*

* Thanks to Larissa Mooney for following slides

Medications Considered for Cocaine Use Disorder

Positive/Under Consideration

topiramate*

modafinil*

bupropion*

amphetamine salts*

disulfiram (mixed, worse retention)

propranolol (WD)

buprenorphine+naltrexone

Medications for Methamphetamine Use Disorder

Positive/Under Consideration

bupropion (better in low severity users)
mirtazapine
naltrexone
methylphenidate
    d-amphetamine (craving/WD)
topiramate* (better if abstinent at tx entry)

Stimulant Use by Patients on OUD Medications

Stimulant Use by Patients on OUD Medications

Stimulant use by patients on methadone: We've been here before

- **In the late 1980s and 1990s, the cocaine epidemic seriously damaged the treatment progress of many patients on methadone.**
- **In many OTPs, 70% + of UAs were positive of cocaine.**
- **The treatment progress for many patients on methadone and who had not used illicit drugs for years was seriously degraded by high levels of cocaine use. This was particularly true once crack became available.**
- **Dramatic increases in injection drug use, HIV, Hep C and drug-related crime were associated with the elevated cocaine use. Premature treatment termination/drop-out rates increased dramatically.**
- **Many OTPs became locations for cocaine dealing and associated behaviors**

Qualitative interviews with patients on medication for OUD

- Estimates from clinicians in Vermont H&S network suggest that 20-40% of individuals on MOUD are using cocaine/methamphetamine.
- Stimulant use is a significant concern to clinicians treating patients with MOUD.
- Interviews with a group of 25 stimulant-using patients in MOUD, suggest that **current treatments (increased counseling) are not effective in addressing their ongoing stimulant use.**

What Did the Patients say?

What are/were the challenges of stopping stimulant use?

- **Love the drug effect and in a perfect world would use all the time**
- **Craving/desire is very powerful and ambivalent about stopping**
- **Drug is widely available in inexpensive dosage forms**
- **Craving is triggered by many things**
  - **Coming to the clinic**
  - **Standing in long dosing lines with drug conversations**
  - **Parts of town**
  - **Drug using friends**
  - **Dealers phone calls**
  - **Boredom**

What Else Did the Patients Say?

Was any form of treatment useful?

- **2 people reported that drug court was the key to their stopping**
- **2 people had previously been in a study of contingency management and found it very useful**
- **With both of these "interventions" patients said the immediate certain consequences resulting from the results of a UA gave them something to "hold on to". Although in drug court the main focus is on the negative contingency, the 2 patients talked about how rewarding it was to get the praise from the drug court folks and the judge for giving stimulant free samples.**

Thank you

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