

# CASE-BASED LEARNING COLLABORATIVE ON STIMULANTS

## CME BI-WEEKLY SERIES

CENTER FOR BEHAVIORAL AND ADDICTION MEDICINE

UCLA DEPARTMENT OF FAMILY MEDICINE

1<sup>st</sup> and 3<sup>rd</sup> - Fridays at 12pm-1pm PT



# HIV, STIs, and Methamphetamine Among Men Who Have Sex with Men

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# Overview

- Review the epidemiology of methamphetamine use and its association with HIV/STI transmission
- Discuss Chemsex as a core public health problem
- Review practical approaches to harm reduction for stimulant use and HIV/STI prevention
  - Medical management
  - Behavioral therapies
- Future directions for treatment and prevention

# Who Am I?

- UCLA DGSOM Professor-in-Residence
  - Department of Medicine, Division of Infectious Diseases
  - Department of Family Medicine
  - Medical Director, UCLA Vine Street Clinic
  - Program Director, UCLA South American Program in HIV Prevention Research (SAPHIR)
- Research on HIV/STI Epidemiology, Prevention and Treatment among MSM and TW from 2005
  - Epidemiology of HIV and STIs Among MSM-TW in Peru
  - Partner Notification and Treatment
  - Social Network-Based Approaches to PrEP/ART Adherence for TW
  - Contingency Management for Integrated HIV Prevention and Substance Use Harm Reduction in Methamphetamine Users

# Epidemiology of Methamphetamine Use

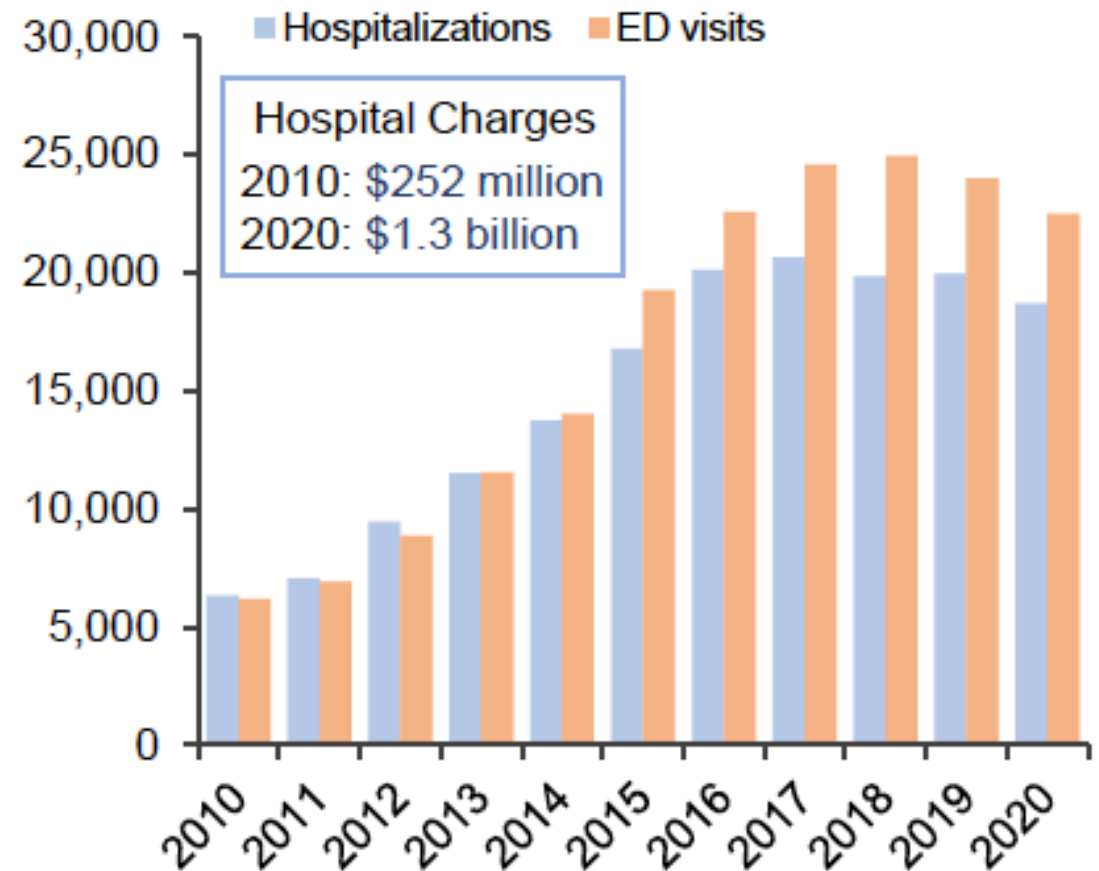
- Global prevalence of amphetamine use estimated as 0.7% of the population, with 11% of users meeting criteria for dependence
- 0.7% of all respondents and 2.3% of gay or lesbian participants in the 2018 National Survey on Drug Use and Health (NSUDH) reported MA use in past year
- MA use has rapidly increased over the past decade
  - 1.04% of adults in California reported use during the past year
  - 20.1% of MSM between the ages of 15-22 reported recent use
  - In a national probability sample (1994-1998) 32.0% of MSM in Los Angeles reported using MA in the preceding 6-months

- 196% increase in MA-associated hospitalizations from 2010-2020 and 264% rise in MA-associated ED visits

“Methamphetamine Misuse/Abuse and Consequences”

Los Angeles County Health Department  
SAPC Data Brief, July 2022

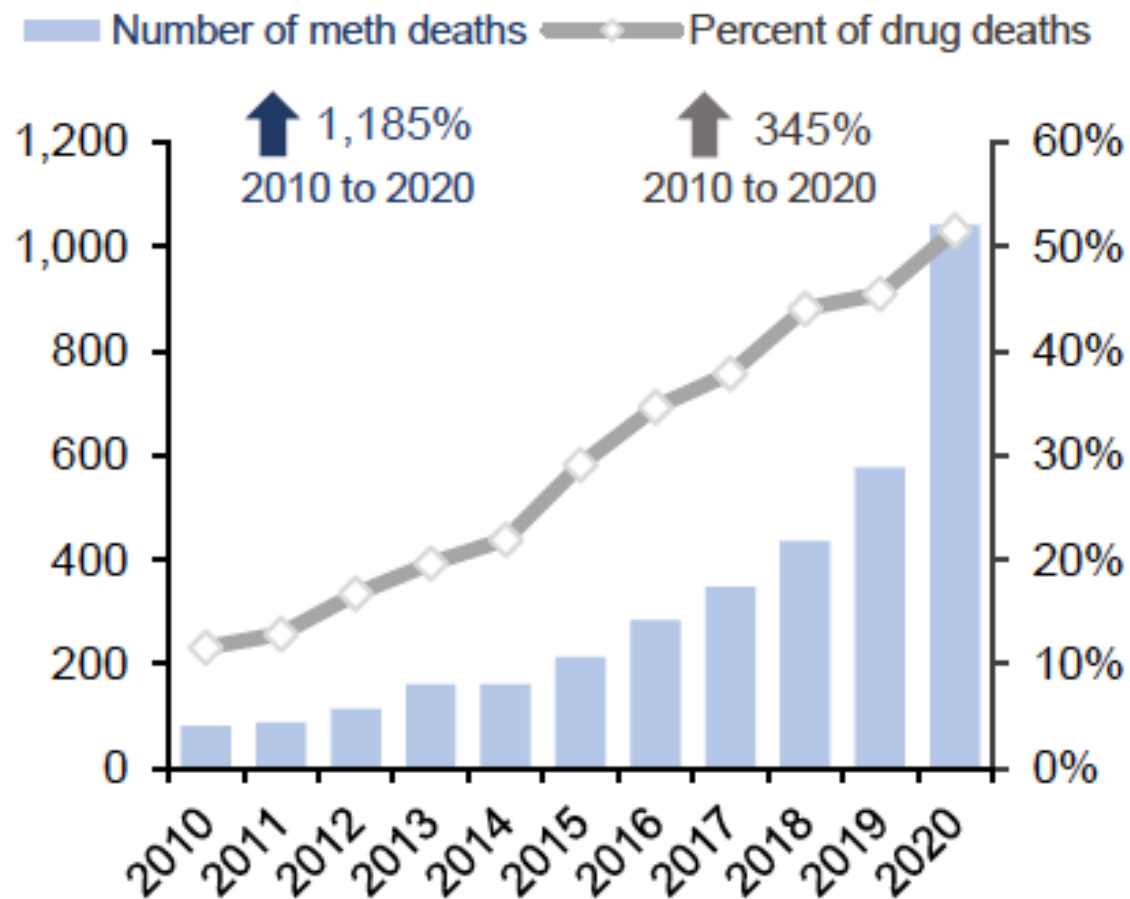
### Meth-related<sup>a</sup> hospitalizations and ED visits, Los Angeles County (LAC), 2010-2020<sup>14</sup>



Meth-related hospitalizations and ED visits increased from 2010-2017 and has remained high in LAC

- Drug overdoses associated with MA increased by 1,185% in the same time period

## Meth overdose-related deaths, LAC, 2010-2020<sup>15</sup>



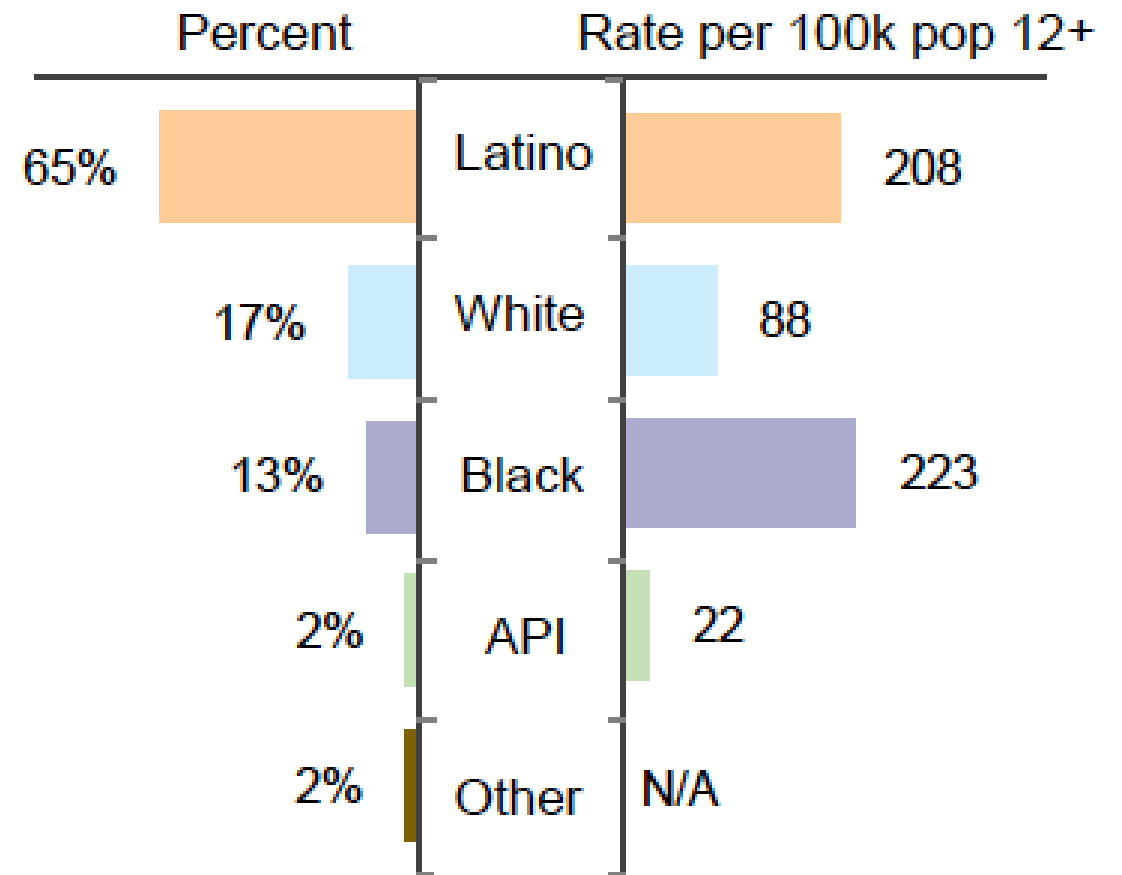
“Methamphetamine Misuse/Abuse and Consequences”

Los Angeles County Health Department SAPC Data Brief, July 2022

Meth-related deaths and its percent of all drug deaths in LAC increased from 2010-2020

## Race/ethnicity among patients with primary meth problem, LAC, FY2021<sup>16</sup>

- While MA use affects all racial and ethnic groups, African-American and Latinx men are most frequently affected



“Methamphetamine Misuse/Abuse and Consequences”

Los Angeles County Health Department  
SAPC Data Brief, July 2022

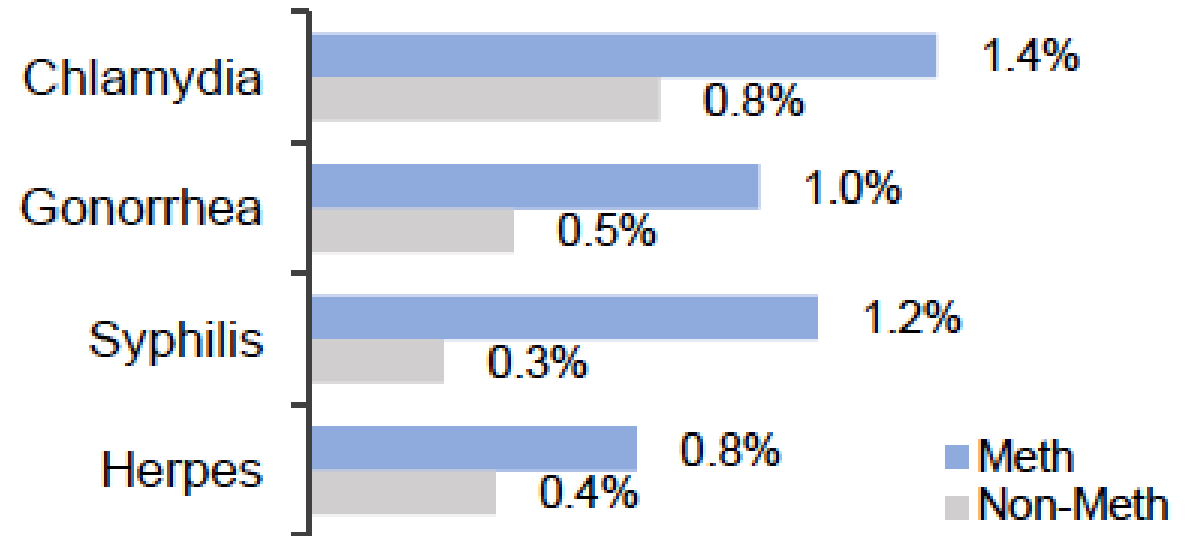


- Frequency of STIs diagnosed substantially higher among patients admitted with MA-related problems
- Methamphetamine-Syphilis-HIV syndemic a key public health problem in Los Angeles

“Methamphetamine Misuse/Abuse and Consequences”

Los Angeles County Health Department SAPC Data Brief, July 2022

### Diagnosed STDs among patients with primary meth and non-meth problem, LAC, FY2021<sup>16</sup>



- Most individuals with problematic MA use report use in association with sex

**Meth use before/during sex among patients with primary meth problem, LAC, FY2021<sup>16</sup>**



“Methamphetamine Misuse/Abuse and Consequences”

Los Angeles County Health Department  
SAPC Data Brief, July 2022

# Case Discussion: Primary Care

- Julio, 31 yo cis-male Latinx Film Producer
- Routine physical exam
- Medical History
  - HIV+ (Dx 2016) on Biktarvy; Viral Load 15k at last visit
  - Dx rectal gonorrhea 3x; urethral chlamydia 1x; pharyngeal GC/CT 2x; HSV-2+
  - Borderline hypertension (BP 140/85 over 2 years)
- Social History
  - Lives in West Hollywood with husband (Max; HIV- on PrEP) and Labrador (Chloe)
  - Multiple sexual partners (approximately 5-10 per week, frequency highly variable, meets via hook-up apps or sex parties), all cis-male, oral and anal sex, versatile, HIV status usually not discussed, no condom use with any

- Social History (Cont.)
  - Binge EtOH use on weekends
  - Smokes socially on weekends
  - Methamphetamine use initially recreational on weekends (together with husband), now daily (oral, no injection) with increasing frequency of use and tolerance developing over the past few months, reports unable to have sex without MA
  - MA use now causing problems with work (potential loss of employment) and personal relationships (alienation from family): “I need to stop, this is going to ruin my life.”

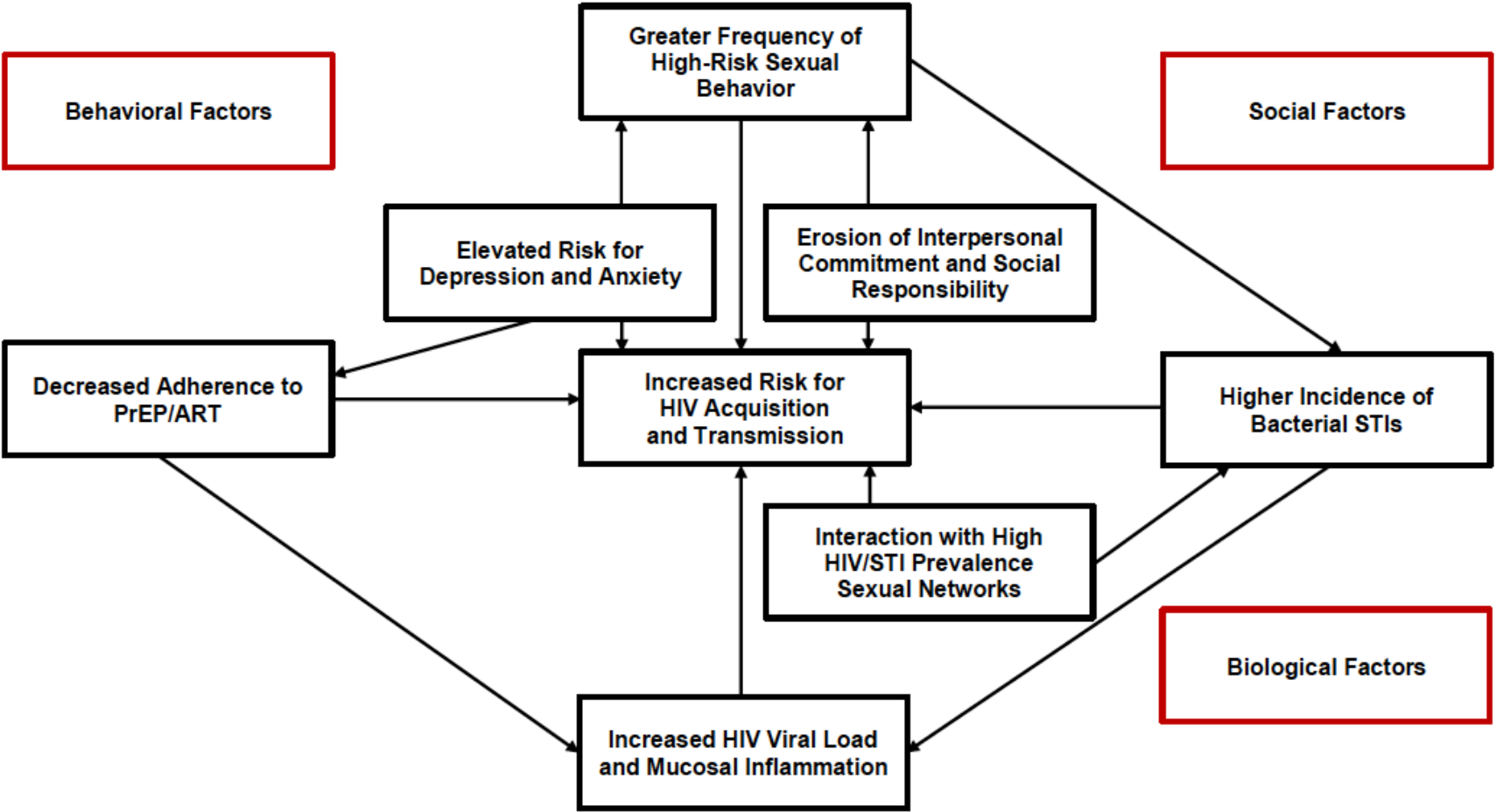
# Physical Exam



# What is Chemsex?

- “Substance use to enhance, prolong, or facilitate high-risk sexual behavior among MSM.”
- More than a simple additive relationship (Sex + Drug Use) but a complex interplay (Sexualized Drug Use) with synergistic effects on HIV/STI risk
  - Heightened pleasure and pleasure-seeking behavior
  - Lowered sexual inhibitions and enhanced body image
  - Extended periods of prolonged sexual activity
  - Frequently unable to dissociate sex from substance use
- Merits a similarly sophisticated/complex response
  - Integration of behavioral and pharmacologic therapy with modification of the social contexts of chemsex

# Methamphetamine and HIV Transmission Risk



# Pharmacologic Therapy

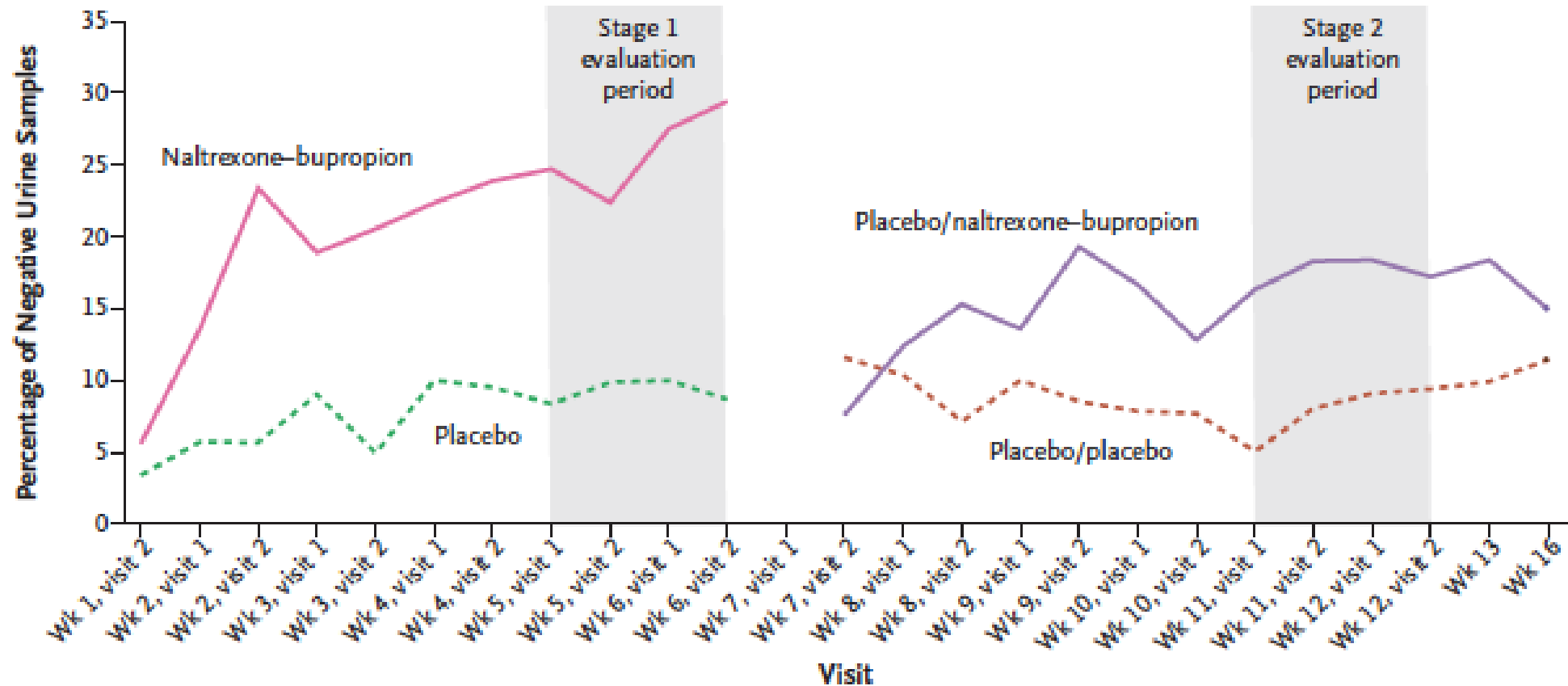
- “Only psychosocial interventions have demonstrated efficacy in reducing stimulant use in patients with stimulant use disorder.”  
-UpToDate
- Naltrexone-Bupropion (ADAPT-2)
- Mirtazapine



# ADAPT-2

- 11% overall treatment effect

## B Methamphetamine-Negative Urine Samples



Trivedi et al., NEJM 2021

# ADAPT-2: Subgroup Analysis

- Benefits of tx greater among MSM/W than among Men Who Have Sex with Women (Only)
- Similar frequency of chemsex (33% of MA use days) and condomless sex (100% of encounters), but MSM/W report larger number of recent sex partners (4 vs. 1)

Comparison of the adjusted treatment effect for extended-release naltrexone plus bupropion (XR-NTX + BUP) versus placebo for MSM/W and MSW participants.

Subgroup	Stage 1			Stage 2			NTX-BUP vs Placebo Treatment Effect*			
	# Randomized	Placebo Responder Rate	XR-NTX + BUP Responder Rate	# Re-randomized	Placebo Responder Rate	XR-NTX + BUP Responder Rate	Treatment Effect (h)	Standard Error of h	Number Needed to Treat	p-value
MSM/W	151	(3/108) 0.0278	(6/43) 0.1395	90	(2/47) 0.0426	(10/43) 0.2326	0.1479	0.0357	6.7	0.04
MSW	95	(4/69) 0.0580	(2/26) 0.0769	50	(0/22) 0.0000	(1/28) 0.0357	0.0227	0.0484	41.3	

# Mirtazapine

Figure 2. Proportion of Participants With Positive Urine Test Results for Methamphetamine During Follow-up, by Arm

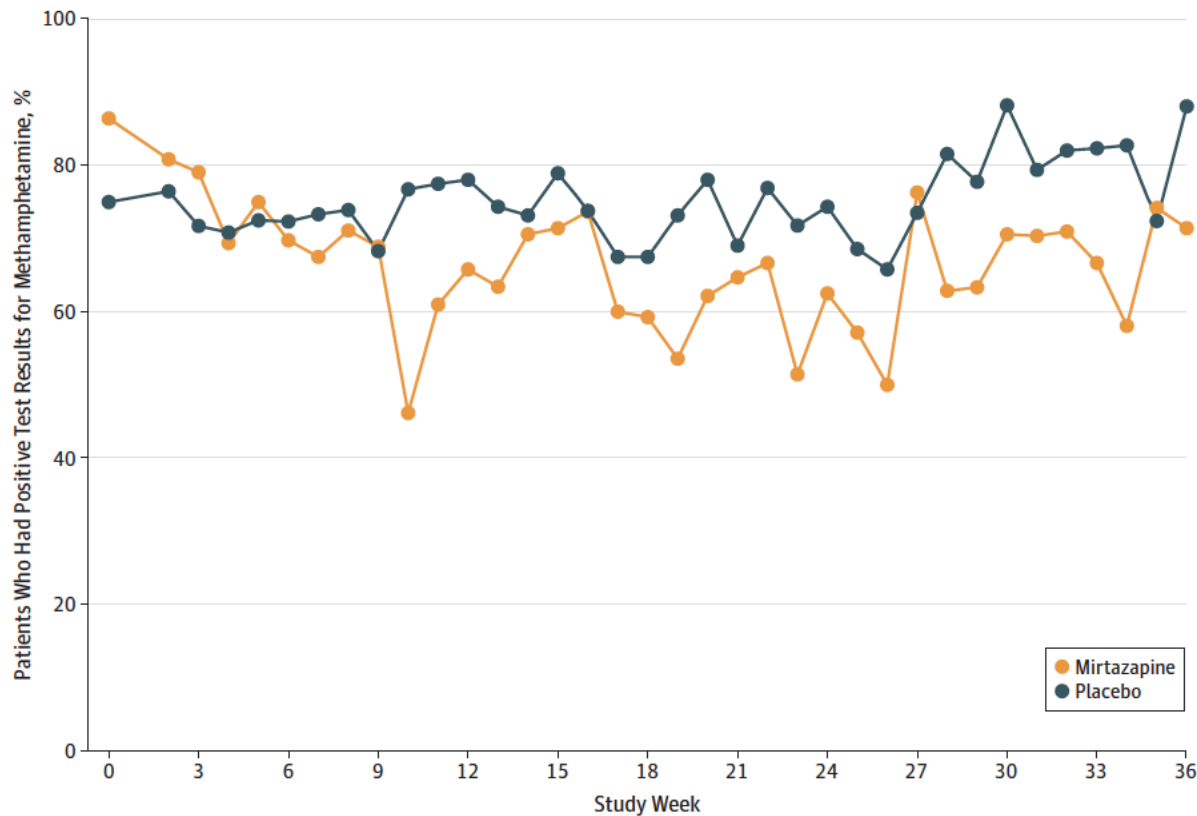


Table 2. Primary and Secondary Outcomes and Sensitivity Analyses

Outcome	Risk Ratio or Coefficient (95% CI)	P Value
<b>Primary Outcomes</b>		
Intent-to-treat analyses <sup>a</sup>		
Treatment effect at 12 wk	0.67 (0.51-0.87)	.003
Net treatment effect at 24 wk <sup>b</sup>	0.75 (0.56-1.00)	.05
Net treatment effect at 36 wk <sup>c</sup>	0.73 (0.57-0.96)	.02

- 115 MSM and 5 TW
- Participants in Mirtazapine arm also reported significantly fewer sexual partners, serodiscordant partners, and CRAI with serodiscordant partners than participants in the placebo arm

Coffin et al., JAMA Psychiatry 2019

# Case Discussion: Treatment Plan I

- Julio decides to start medication
  - Referred to outpatient facility for behavioral treatment
  - Does not like needles (especially after PCN injection)
    - Mirtazapine QHS
  - Plan for Follow up in 1 month

# Case Discussion: Follow-up (1 Month)

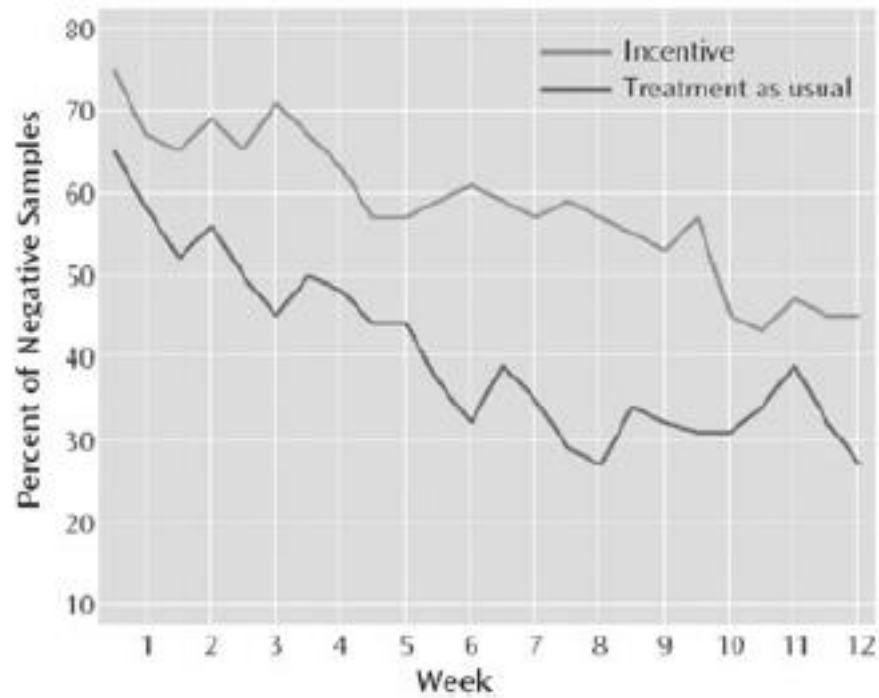
- Julio returns to clinic with his husband Max
- Started Mirtazapine, has not been able to start behavioral tx
- Reports moderate decrease in MA use and sexual activity (and decrease in cravings) over the past month but still using several days a week in conjunction with sex
- Reveals ongoing difficulty remembering to take his ART (misses 3-4 days/week)
- Max reports similar problems with remembering to take PrEP and seroconverted last week, now seeking to start ART

# Behavioral Therapy

- Contingency Management
- Cognitive Behavioral Therapy
- Affect Regulation

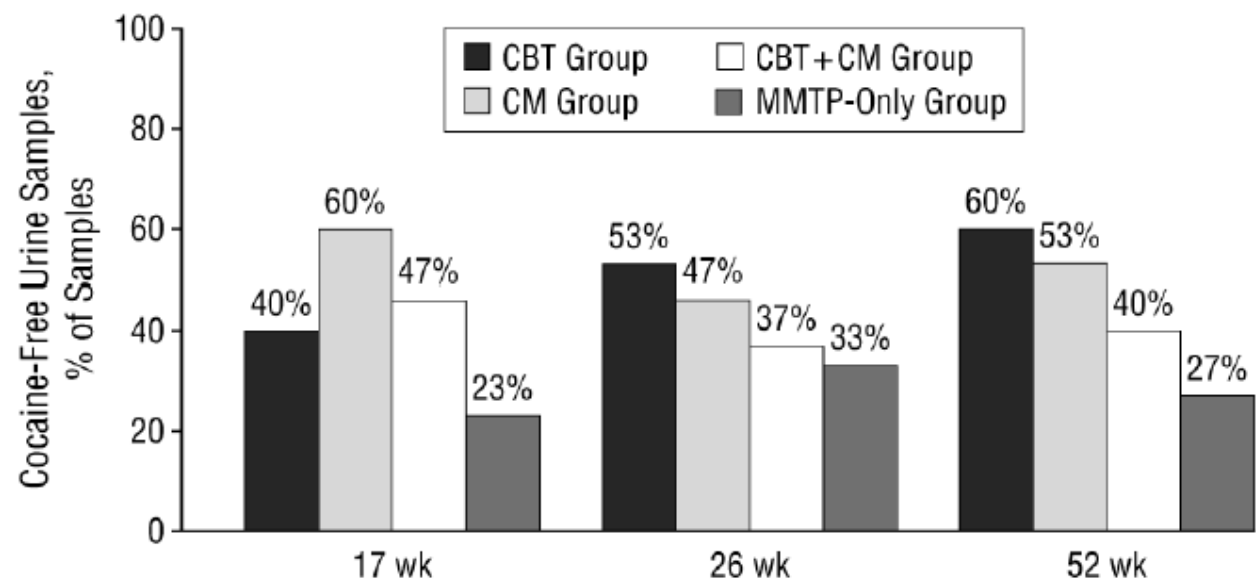
# Contingency Management

- Only psychosocial intervention shown to consistently reduce stimulant use among treatment-seeking individuals
- Provision of an escalating series of small, frequent rewards in exchange for sustained abstinence confirmed by negative UDS at regular (2-3x/week) visits
- Rewards provide a substitute for the immediate gratification of MA use and address “Delay Discounting” common in substance use
- Sustained reductions in use/abstinence support operant conditioning and allow transformation of behavioral patterns



**Figure 1** Methamphetamine use during the course of the 12-week intervention. Reprinted with permission from Roll *et al.* [20]

Roll, *Addiction* 2007



Rawson *et al.*, *Archives General Psychiatry* 2002



Measures of treatment retention and methamphetamine abstinence by condition at the end of treatment and at 6- and 12-month evaluations

Variables	Treatment condition			
	CBT ( <i>n</i> = 40) <i>M</i> (S.D.) or %	CM ( <i>n</i> = 42) <i>M</i> (S.D.) or %	CBT + CM ( <i>n</i> = 40) <i>M</i> (S.D.) or %	GCBT ( <i>n</i> = 40) <i>M</i> (S.D.) or %
<b>End of treatment measures</b>				
Retention <sup>a</sup> (weeks)	8.9 (6.7)	12.0 (5.7)	13.3 (4.8)	11.3 (6.3)
Longest consecutive negative urine samples <sup>b</sup> (weeks)	2.1 (2.0)	5.1 (4.9)	7.0 (5.2)	3.5 (3.4)
Treatment Effectiveness Score <sup>c</sup>	15.8 (13.6)	25.9 (16.4)	32.8 (16.5)	23.5 (16.7)
Percent of negative urine samples (%)	75.0	83.3	92.9	80.0
Reported days methamphetamine use in previous 30	2.2 (6.0)	2.7 (4.6)	1.7 (5.1)	2.9 (5.7)
<b>6-month Evaluations</b>				
Percent of negative urine samples (%)	78.3	76.5	77.8	69.7
Reported days methamphetamine use in previous 30	1.2 (2.1)	2.3 (5.1)	1.6 (2.7)	3.6 (7.0)
<b>12-month Evaluations</b>				
Percent of negative urine samples (%)	81.8	72.7	73.0	66.7
Reported days methamphetamine use in previous 30	3.6 (7.1)	2.7 (4.4)	3.0 (5.4)	5.5 (8.5)

<sup>a</sup>  $F(3,158) = 3.78, p < .02$ ; post hoc comparisons showed CBT shorter than CM and CBT + CM,  $p < .05$ .

<sup>b</sup>  $F(3,158) = 11.08, p < .001$ ; post hoc comparisons showed CBT shorter than CM and CBT + CM,  $p < .001$ ; these values reflect the average of the longest number of days of documented methamphetamine abstinence by condition.

<sup>c</sup>  $F(3,158) = 7.35, p < .001$ ; post hoc comparisons showed CBT lower than all other conditions,  $p < .05$ ; the Treatment Effectiveness Score represents the average number of urine samples provided by condition that were methamphetamine metabolite-free.

Standardized mean difference effect sizes for the original intervention (Study #1) and the modified intervention (Study #3) and the replicated intervention (Study #2) and the modified intervention (Study #3) for measures at end of treatment and at 26-week follow-up.

	Studies						Comparisons			
	Original intervention (Study #1) (n= 40)		Replicated intervention (Study #2) (n= 46)		Modified intervention (Study #3) (n= 171)		Original intervention (Study #1) vs. modified intervention (Study #3)		Replicated intervention (Study #2) vs. modified intervention (Study #3)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Std mean difference (SMD) <sup>a</sup> (95% C. I.)		Std mean difference (SMD) <sup>a</sup> (95% C. I.)	
<i>End of treatment measures</i>										
Retention (weeks) standardized <sup>b</sup>	11.3	6.3	12.78	4.8	11.02	6.24	-0.04	-0.39, 0.30	-0.29	-0.62, 0.03
Longest consecutive negative urine samples (weeks)	3.5	3.4	NA	NA	2.35	2.39	-0.44**	-0.79, -0.09	NA	NA
Treatment effectiveness score (standardized) <sup>b</sup>	23.4	16.7	22.2	12.3	22	17.12	-0.09	-0.43, 0.26	-0.01	-0.34, 0.31
Reported days methamphetamine use in previous 30 days	2.9	5.7	2.1	4.1	4.32	6.78	0.21	-0.13, 0.56	0.35*	0.02, 0.68
Percent of negative urine samples (%) and (risk ratio)	(80.0%)		(81.0%)		(82.8%)		(0.97)	(0.78, 1.20)	(0.98)	(0.78, 1.23)
<i>Sexual behavior<sup>c</sup></i>										
Number male partners	5.2	8.4	3.3	4.4	3.21	4.52	-0.36*	-0.71, -0.02	-0.02	-0.35, 0.31
URAI	0.2	0.6	1.1	3.1	1.05	2.70	0.35	0.00, 0.69	-0.02	-0.34, 0.31
UIAI	0.4	1.2	0.9	2.2	1.38	4.05	0.26	-0.08, 0.61	0.13	-0.20, 0.45
<i>Week 26</i>										
Reported days methamphetamine use in previous 30 days	3.6	7.0	3.6	7.0	3.89	6.72	0.04	-0.30, 0.39	0.04	-0.28, 0.37
Percent of negative urine samples (%) and (risk ratio)	(69.7%)		(82.1%)		(85.1%)		(0.81)	(0.63, 1.03)	(0.96)	(0.82, 1.13)
<i>Sexual behavior<sup>c</sup></i>										
Number male partners	5.4	9.4	5.2	8.8	2.51	3.86	-0.54**	-0.89, -0.19	-0.51**	-0.84, -0.18
URAI	0.9	1.8	2.1	4.5	1.17	3.04	0.09	-0.25, 0.44	-0.27	-0.60, 0.05
UIAI	0.6	1.2	1.1	2.4	.83	1.78	0.14	-0.21, 0.48	-0.14	-0.47, 0.19

<sup>a</sup> Standardized mean difference effect sizes are based on Cohen's *d* utilizing a pooled standard deviation. An effect size 0.2 to 0.3 would be a small effect, around 0.4 to 0.7 a medium effect and 0.8 or greater a large effect (Cohen, 1988).

<sup>b</sup> Original values adjusted for comparison.

<sup>c</sup> Self-reported sexual risk behaviors in the previous 30 days.

\* *p* < .05.

\*\* *p* < .01.

# Savers vs. Spenders

- In CM trials, participants who regularly cashed in frequent, small rewards had a better response than those who saved their rewards for a big ticket item
- Supports Delay Discounting theory underlying CM

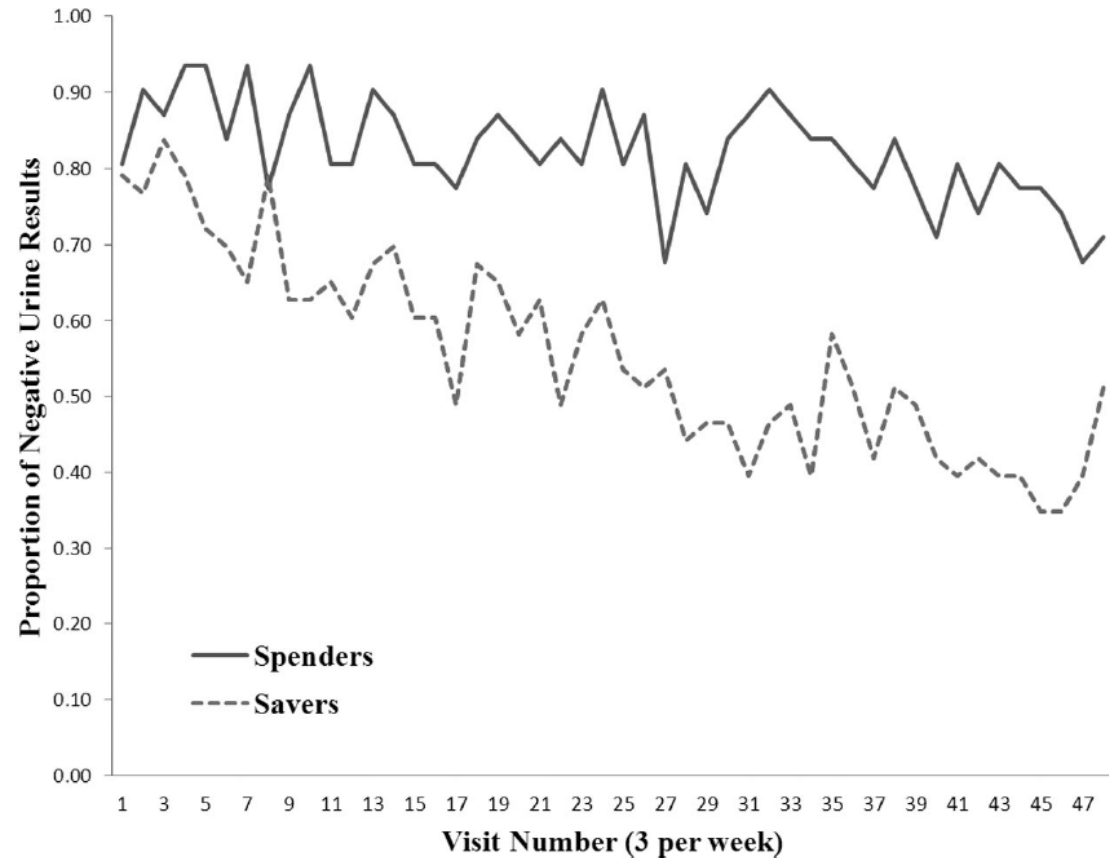


Figure 2. Negative urine results trends over time for “spenders” and “savers.”

**Table 3. Bivariate and Multivariate Associations Between Sexual Risk-taking/Stimulant-use Outcomes and Conditions**

No. of Male Sexual Partners at 6 m Follow-up			No. Times Engaged in Condomless Anal Intercourse at 6 m Follow-up			No. of Stimulant Metabolite-free Urine Samples Submitted During Intervention		
Bivariate (NCYC = 59; CM = 56)			Bivariate (NCYC = 59; CM = 56)			Bivariate (NCYC = 70; CM = 70)		
Student <i>t</i> test			Student <i>t</i> test (Unequal Variance)			Student <i>t</i> test		
NCYC	CM	<i>P</i> Value	NCYC	CM	<i>P</i> Value	NCYC	CM	<i>P</i> Value
Mean = 1.48	Mean = 1.68	<i>P</i> = .60	Mean = 1.39	Mean = 0.82	<i>P</i> = .43	Mean = 6.06	Mean = 8.87	<i>P</i> = .04
SD = 1.99	SD = 2.11		SD = 5.06	SD = 1.78		SD = 6.12	SD = 9.21	
Multivariate <sup>a</sup> (NCYC = 57; CM = 55)			Multivariate <sup>a</sup> (NCYC = 57; CM = 55)			Multivariate <sup>a</sup> (NCYC = 68; CM = 69)		
Robust Negative Binomial Regression			Robust Negative Binomial Regression			Robust Negative Binomial Regression		
	IRR (95% CI)	<i>P</i> Value		IRR (95% CI)	<i>P</i> Value		IRR (95% CI)	<i>P</i> Value
CM	1.10 (0.67–1.81)	<i>P</i> = .71	CM	.66 (0.26–1.69)	<i>P</i> = .39	CM	1.57 (1.12–2.22)	<i>P</i> = .01

All significance tests 2-tailed.

Abbreviations: CI, confidence interval; CM, contingency management; IRR, incidence rate ratio; NCYC, noncontingent yoked condition; SD, standard deviation.

<sup>a</sup> Controls: race/ethnicity, sexual identity, income, homelessness.

- Over a 12-week follow-up period, 93% of participants in the CM arm demonstrated a pattern of either sustained MA abstinence or single, isolated episodes of relapse
- 48% of men in the NCYC arm provided either repeatedly or consistently MA-positive urine samples

**Table 2**

Intervention response patterns: group size, distribution across conditions, and baseline urinalysis result.

Intervention response pattern	N	Condition		Stimulant-positive urinalysis at baseline
		NCYC	CM	
Responder	77	36%	64%	22%
Single positive	10	20%	80%	70%
Worsening	17	77%	23%	60%
Non responder	15	100%	0%	50%

Landovitz et al., OFID 2014  
Shoptaw et al., JSAT 2017

**Table 4 Effect of a contingency management intervention on detection of methamphetamine use by rapid urine screen and on self-reported frequency and quantity of methamphetamine use in the prior 6 weeks**

Positive methamphetamine urinalysis, n (%)					
Visit	Total	Contingency Management	Control	Unadjusted RR (95% CI)	Adjusted RR <sup>a</sup> (95% CI)
Baseline	44/127 (35)	28/70 (40)	16/57 (28)		
Week 6	27/92 (29)	17/48 (35)	10/44 (23)		
Week 12	33/100 (33)	20/55 (36)	13/45 (29)	1.39 (0.81, 2.38)	1.09 (0.76, 1.57)
Week 18	39/97 (40)	24/52 (46)	15/45 (33)		
Week 24	39/105 (37)	29/58 (50)	10/47 (21)	<b>1.77 (1.13, 2.78)</b>	1.21 (0.95, 1.54)
Self-reported weekly or more frequent methamphetamine use, n (%)					
Visit	Total	Contingency Management	Control	Unadjusted RR (95% CI)	Adjusted RR <sup>b</sup> (95% CI)
Baseline	83/127 (65)	51/70 (73)	32/57 (56)		
Week 6	32/92 (35)	20/48 (42)	12/44 (27)		
Week 12	39/102 (38)	25/56 (45)	14/46 (30)	1.50 (0.93, 2.42)	1.29 (0.82, 2.04)
Week 18	37/99 (37)	26/53 (49)	11/46 (24)		
Week 24	40/107 (37)	29/60 (48)	11/47 (23)	<b>2.06 (1.29, 3.29)</b>	<b>1.76 (1.13, 2.73)</b>
Self-reported use of more than eight quarters of methamphetamine, n (%)					
Visit	Total	Contingency Management	Control	Unadjusted RR (95% CI)	Adjusted RR <sup>c</sup> (95% CI)
Baseline	59/127 (46)	37/70 (53)	22/57 (39)		
Week 6	22/91 (24)	14/47 (29)	8/44 (18)		
Week 12	28/99 (28)	21/55 (37)	7/44 (16)	<b>2.01 (1.09, 3.73)</b>	1.80 (0.95, 3.40)
Week 18	23/97 (24)	19/52 (36)	4/45 (9)		
Week 24	30/105 (29)	24/59 (40)	6/46 (13)	<b>3.52 (1.70, 7.30)</b>	<b>3.02 (1.47, 6.23)</b>

CI, confidence interval; RR, relative risk; one quarter of methamphetamine is equivalent to 0.25 grams. Statistically significant results ( $P < 0.05$ ) are bolded.

<sup>a</sup>Adjusted for methamphetamine urinalysis result at baseline and stage of change for methamphetamine use at baseline (maintenance, action, preparation, contemplation, pre-contemplation, missing).

<sup>b</sup>Adjusted for baseline self-reported weekly or more frequent use of methamphetamine in the prior 6 weeks.

<sup>c</sup>Adjusted for baseline self-reported use of more than eight quarters of methamphetamine in the prior 6 weeks.



- Menza trial enrolled all comers, regardless of treatment-seeking intent
- Patterns of attendance and MA-free urine samples reflect general lack of engagement with CM
- Attendance patterns mirrored by abstinence patterns (a small subgroup attended visits and provided clean urine)

Menza et al., BMC Public Health 2010

**Table 2 Contingency management intervention metrics**

Metric <sup>a</sup>	Participants (n = 70) <sup>b</sup>
% Visits attended, mean (SD); median (IQR)	37 (1.4); 25 (8-54)
% Visits attended, n (%)	
	0%
	4 (6)
	1-25%
	32 (46)
	26-50%
	15 (21)
	51-75%
	10 (14)
	75-99%
	6 (9)
	100%
	3 (4)
% Metabolite-free urine samples out of those attended, mean (SD); median (IQR)	75 (3.6); 85 (0.5-1.0)
% Metabolite-free urine samples out of total possible visits, mean (SD); median (IQR) <sup>b</sup>	29 (1.3); 18 (8-42)
% Metabolite-free urine samples, n (%) <sup>c</sup>	
	0%
	7 (10)
	1-25%
	37 (53)
	26-50%
	13 (19)
	51-75%
	5 (7)
	75-99%
	6 (9)
	100%
	2 (3)
Number of continuous metabolite-free samples, mean (SD); median (IQR) <sup>f</sup>	4.2 (5.5); 2 (1-5)
Number of continuous metabolite-free samples, n (%) <sup>f</sup>	
	Never submitted a metabolite-free sample
	7 (10)
	Submitted only single, non-consecutive metabolite-free samples
	25 (36)
	2-8
	28 (40)
	9-12
	4 (6)
	13-24
	6 (9)

# What about sexual risk behavior?

- Unplanned, indirect benefit of reducing high-risk sexual behavior (serodiscordant, condomless receptive anal intercourse)

**Table III.** Sexual Partners in Previous 30 Days at Baseline and at 1-Year Follow-Up Evaluation, Full Sample

	Baseline ( <i>n</i> = 120) % ( <i>n</i> ) or mean ( <i>SD</i> )	1-year follow-up ( <i>n</i> = 120) % ( <i>n</i> ) or mean ( <i>SD</i> )	<i>p</i>
Percent reporting no sexual partners	11.8 ( <i>n</i> = 14)	32.5 ( <i>n</i> = 39)	<.001
Percent reporting 1–10 sexual partners	65.8 ( <i>n</i> = 79)	64.2 ( <i>n</i> = 77)	
Percent reporting 11 or more sexual partners	22.4 ( <i>n</i> = 27)	3.3 ( <i>n</i> = 4)	
Mean number of sexual partners	8.6 ( <i>SD</i> = 13.7)	2.9 ( <i>SD</i> = 4.8)	<.001

**Table IV.** Reported Sexual Risk Behaviors at Baseline and at 1-Year Follow-Up Evaluation, Full Sample

	Baseline ( <i>n</i> = 129) %	1-year follow-up ( <i>n</i> = 129) %	<i>p</i>
Any oral sex	80.2	54.2	<.001
Protected receptive anal intercourse	28.4	13.3	<.01
Unprotected receptive anal intercourse	37.7	14.2	<.001
Protected insertive anal intercourse	24.7	20.0	
Unprotected insertive anal intercourse	36.4	16.7	<.001
Fisting and/or fingering	42.6	19.2	<.001
Rimming (oral/anal contact)	51.9	31.7	<.01
Any public sex	43.8	17.5	<.001

Reback, Larkins and Shoptaw, AIDS and Behavior 2004

# CM and Changes in Sexual Behavior

- CM associated with transformations in the meanings and importance of high-risk sexual behavior
- Sobriety modifies awareness of risk to self and others
- Reduction in MA use also reduces frequency of Chemsex

## Before

Paul, HIV+: I had no desire to have unsafe sex without the crystal. But with the crystal I had unsafe sex all the time. I didn't care.

Nathan, HIV-: The first few times I was screwed by a man I always made sure that he had a condom on. And then I noticed that I just made sure that he didn't cum inside of me. Now I'm seeing that's what the crystal is doing to me, I'm letting down my guard. I've compromised and I'm seeing myself compromise more and more in situations like that. Recently I started getting into [swallowing cum]; the crystal use is breaking [my reserve down].

## After

Mark, HIV+: [I've had anal sex] without a condom when sober. It felt like it was wrong. I felt that I knew better than that. And that I had to take some responsibility for what I was doing, and I did.

Al, HIV+: I wouldn't do that [not disclose HIV status] now. I wouldn't do that sober. I wouldn't have anonymous sex and not tell someone and not ask. . . . And I never used to use condoms. . . . When I'm sober I tell people. I'm upfront and I discuss it with them right away, "By the way, I'm positive;" second or third sentence. I don't even wait.

Reback, Larkins and Shoptaw, AIDS and Behavior 2004



- Comparison of CM +/- CBT or Gay-specific CBT
- All arms showed significant, sustained reductions in CRAI
- Effect of GCBT more immediate (though benefit not sustained)

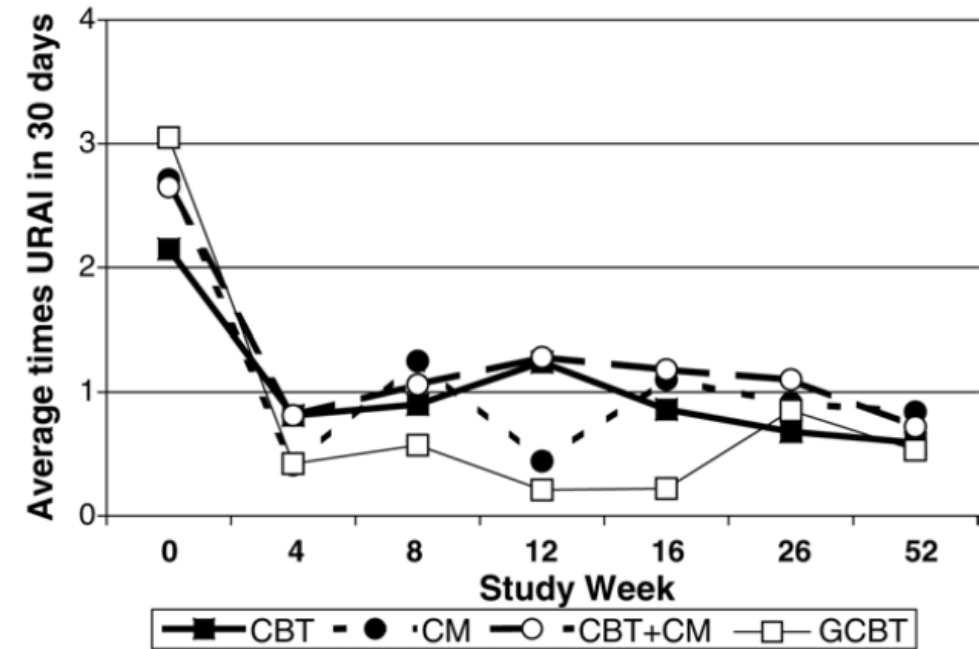


Fig. 1. Reported number of times participants had unprotected receptive anal intercourse (URAI) with someone other than a primary partner in the previous 30 days by treatment condition: standard cognitive behavioral therapy (CBT), contingency management (CM), combined cognitive behavioral therapy and contingency management (CBT + CM), and culturally tailored, GBM-specific cognitive behavioral therapy (GCBT).

Shoptaw et al., Drug and Alcohol Dependence 2005

# CBT

- If CM is clearly more effective, then what is the role of CBT in behavioral management?
- Could the evidence support use of CBT as a behavioral adjunct to help modify sexual risk behavior *in conjunction* with CM and pharmacologic tx?
- “Getting Off” (Reback and Shoptaw, Addictive Behaviors 2014; Reback, Veniegas and Shoptaw, J Homosexuality 2014)

**Table 2**

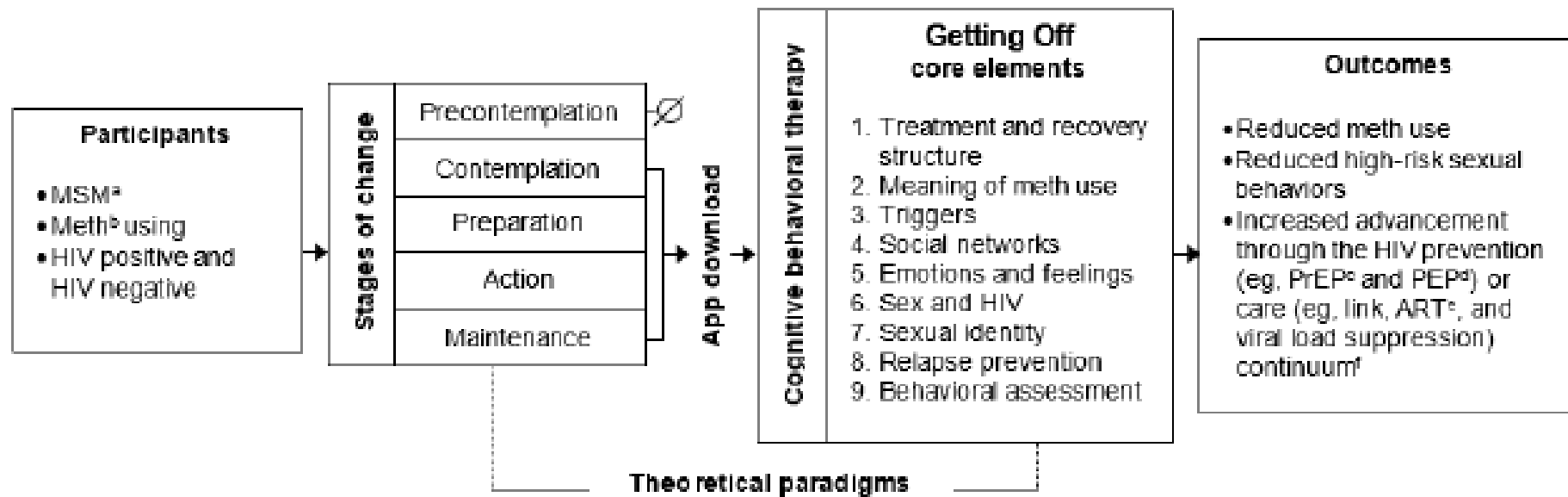
Standardized mean difference effect sizes for the original intervention (Study #1) and the modified intervention (Study #3) and the replicated intervention (Study #2) and the modified intervention (Study #3) for measures at end of treatment and at 26-week follow-up.

	Studies						Comparisons			
	Original intervention (Study #1) (n = 40)		Replicated intervention (Study #2) (n = 46)		Modified intervention (Study #3) (n = 171)		Original intervention (Study #1) vs. modified intervention (Study #3)		Replicated intervention (Study #2) vs. modified intervention (Study #3)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Std mean difference (SMD) <sup>a</sup> (95% C. I.)		Std mean difference (SMD) <sup>a</sup> (95% C. I.)	
<i>Sexual behavior<sup>c</sup></i>										
Number male partners	5.4	9.4	5.2	8.8	2.51	3.86	-0.54**	-0.89, -0.19	-0.51**	-0.84, -0.18
URAI	0.9	1.8	2.1	4.5	1.17	3.04	0.09	-0.25, 0.44	-0.27	-0.60, 0.05
UIAI	0.6	1.2	1.1	2.4	.83	1.78	0.14	-0.21, 0.48	-0.14	-0.47, 0.19

# Getting Off Model

- Theory-based intervention to help MA-using MSM to identify and manage triggers to use

Figure 3. Mechanism of behavior change. ART: antiretroviral therapy; meth: methamphetamine; HIV prevention continuum (HIV testing and pre-exposure prophylaxis/postexposure prophylaxis uptake) and HIV care continuum (link, antiretroviral therapy adherence, and virological suppression); MSM: men who have sex with men; PEP: postexposure prophylaxis; PrEP: pre-exposure prophylaxis.



Reback and Shoptaw, Addictive Behaviors 2014  
 Reback, JMIR Research Protocols 2020

# Affect Regulation

- Targets psychosocial co-morbidities frequently seen in MA-using MSM
- Promote positive affect as a strategy to sensitize recipients to alternate (non-drug related) sources of reward and encourage engagement in tx

**Table 1** Positive affect intervention protocol for methamphetamine-using MSM

Session	Positive affect regulation skills	Adapted intervention content
1	Noticing positive events Capitalizing on positive events Gratitude	Psychoeducation on stimulant withdrawal Capitalizing on non-reactive urine toxicology screens Breathing retraining
2	Mindfulness (informal and formal)	Breath meditation
3	Positive reappraisal	Problem-focused coping and reasoned action Mountain meditation
4	Strengths Attainable goals	
5	Altruism	Loving-kindness meditation

# ARTEMIS Trial

**Table 3**  
Changes in self-reported stimulant use, urine toxicology screening for stimulants, and methamphetamine craving by treatment arm (N = 110).

	ARTEMIS (n = 55) M (SE)	Attention-Control (n = 55) M (SE)	Cohen's <i>d</i> (95% CI)	Group x Time p-value
<b>Pre-Session Methamphetamine Craving</b>				0.073
Session 1	35.98 (3.63)	38.62 (4.21)	–	
Session 2	22.54 (3.51)	30.42 (4.09)	0.29 (-0.09, 0.67)	
Session 3	18.82 (3.45)**	34.57 (4.30)**	0.54 (0.15, 0.93)	
Session 4	16.19 (3.11)*	28.72 (4.22)*	0.46 (0.07, 0.86)	
Session 5	12.58 (2.92)**	28.71 (4.55)**	0.60 (0.20, 1.01)	
<b>Methamphetamine Craving</b>				0.182
Baseline	2.62 (0.18)	2.85 (0.21)	–	
3 Months	1.83 (0.19)*	2.52 (0.24)*	0.50 (0.10, 0.90)	
<b>Self-Reported Stimulant use (past 3 months)</b>				0.072
Screening	4.65 (0.25)	4.51 (0.25)	–	
Baseline	4.16 (0.24)	4.09 (0.24)	–	
3 Months	2.26 (0.31)*	3.22 (0.32)*	0.46 (0.05, 0.86)	
	<b>Median (IQR)</b>	<b>Median (IQR)</b>		<b>p-value</b>
<b>Total Tox- Samples During CM</b>	18 (5 – 27)	14 (4 – 26)		0.75

**Table 4.** Changes in stimulant use and methamphetamine craving by treatment arm (N = 110)

		ARTEMIS (n = 55)	Attention-control (n = 55)	Cohen's <i>h</i> (95% CI)	Group x time p-value
	N	N (%)	N (%)		
Reactive urine toxicology for stimulants					
Screening	110	33 (60)	23 (42)	–	0.017
Baseline	110	26 (47)	27 (49)	–	
3 Months	98	24 (49)	23 (54)	0.09 (-0.32, 0.50)	
6 Months	96	22 (50)	29 (66)	0.32 (-0.09, 0.74)	
12 Months	88	17 (45)	28 (64)	0.38 (-0.05, 0.82)	
15 Months	78	19 (54)	23 (56)	0.04 (-0.41, 0.49)	

- Enrolled participants from an ongoing CM intervention
- Randomly assigned to Affect Regulation (ARTEMIS) or Attention Control (Both + CM)
- Significant improvement in positive affect, reductions in MA craving and maybe MA use (confirmed by UDS)

Carrico et al., JIAS 2019

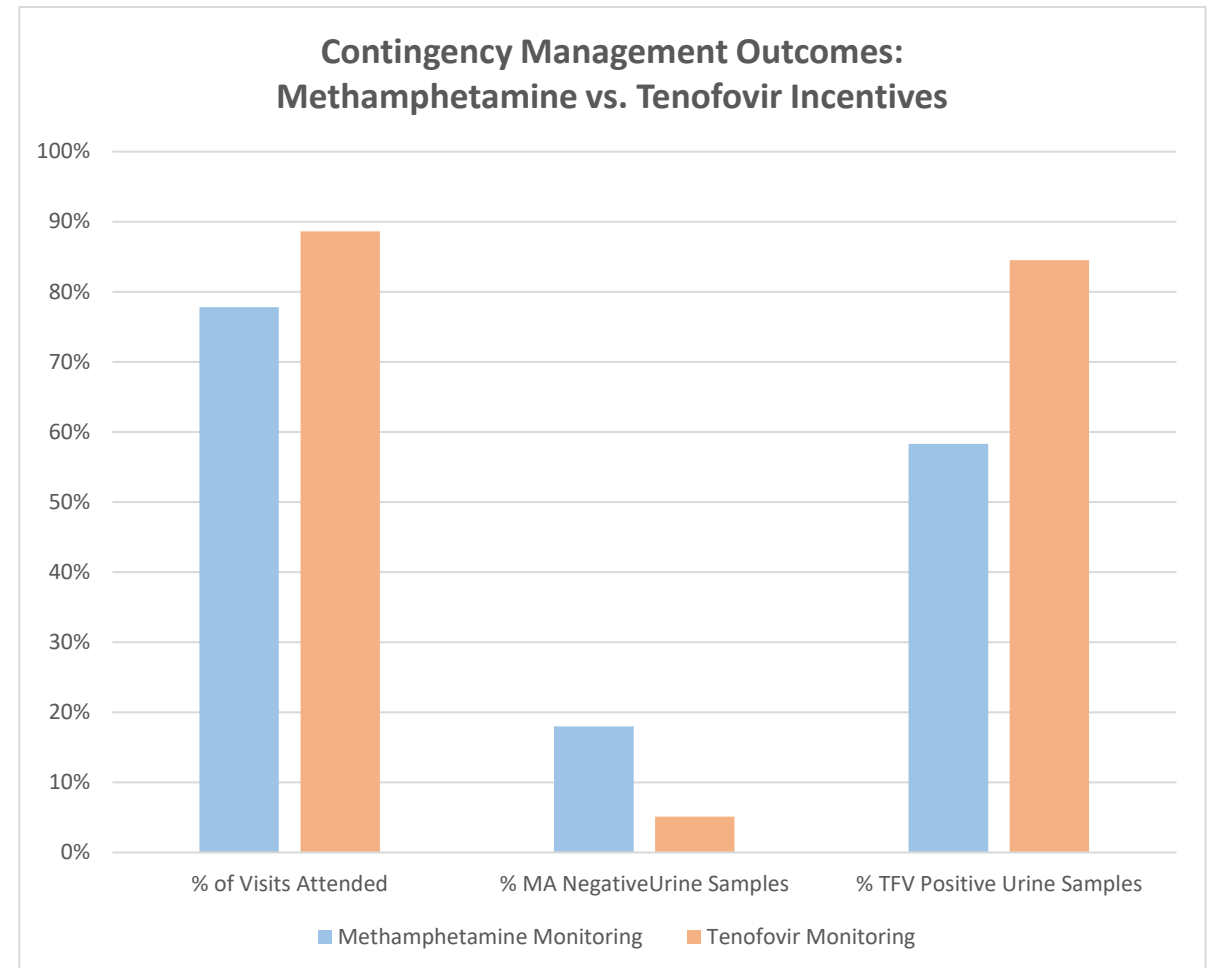
## Case Discussion 2: Follow-up (1 Month)

- Julio considers enrolling in a CM program offered by LA County Health Department
- Reveals he also has ongoing difficulty remembering to take his ART (misses 3-4 days/week), asks about long-acting injectable (LAI) tx
- Max reports similar problems with remembering to take PrEP and seroconverted last week, now seeking to start ART
- New diagnosis has caused both to think about their MA use and consider how it impacts their medication adherence

# CMax: Integrating Substance Use Harm Reduction with HIV Prevention through Contingency Management

- Goal of reducing MA use and improving PrEP/ART adherence
- Non-treatment seeking HIV+ and HIV- MSM randomly assigned to CM based on MA abstinence (Urine -) or Tenofovir adherence (Urine +) and to BIW or TIW monitoring schedule
- Significant improvements in PrEP/ART adherence in TFV arm
- Significant reductions in MA use in MA arm
- Provides model for addressing substance use and HIV prevention through a unified harm reduction platform

Blair et al., AIDS and Behavior 2023



## Case Discussion 3: Follow-up (3 Months)

- Julio and Max both enroll in CMax program; 3 months later:
  - Both reduce their frequency of use without achieving complete abstinence
  - Both improve ART adherence with VL undetectable on recent testing; satisfied with their efforts to stop the spread of HIV in their community
  - Both reduced their number of sexual partners/frequency of sex and now try to routinely disclose their HIV status (and undetectable VL)
  - Both recognize that their social contexts are strong triggers to substance use and are considering how to reorganize their social lives to reduce motivators for MA use