

Methamphetamine: Clinical Challenges and Critical Populations

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Methamphetamine Treatment

CSAT Tip #33

- A useful resource that presents a review of the existing knowledge about treatment effectiveness with stimulant users.
- Treatments for stimulant dependence with empirical support

Limitations on Current Treatments

- Training and development of knowledgeable clinical personnel are essential elements to successfully address the challenges of treating MA users.
- Training alone is insufficient if the funding necessary to deliver these treatment recommendations is not available.
- Treatment funding policies that promote short duration or non-intensive outpatient services are inappropriate for providing adequate funding for MA users.

Special treatment consideration should be made for the following groups of individuals:

- Female MA users (higher rates of depression; very high rates of previous and present sexual and physical abuse; responsibilities for children).
- Injection MA users (very high rates of psychiatric symptoms; severe withdrawal syndromes; high rates of hepatitis).
- MA users who take MA daily or in very high doses.
- Homeless, chronically mentally ill and/or individuals with high levels of psychiatric symptoms at admission.
- Individuals under the age of 21.
- Gay men (at very high risk for HIV and hepatitis).

Brief cognitive behavioural interventions for regular amphetamine users: a step in the right direction

- **Design: RTC**
- **Intervention: 2 session vs 4 session CBT**
- **Findings** The main finding of this study was that there was a significant increase in the likelihood of abstinence from amphetamines among those receiving two or more treatment sessions. In addition, the number of treatment sessions attended had a significant short-term beneficial effect on level of depression. There was a marked reduction in amphetamine use among this sample over time and, apart from abstinence rates and short-term effects on depression level, this was not differential by treatment group. Reduction in amphetamine use was accompanied by significant improvements in stage of change, benzodiazepine use, tobacco smoking, polydrug use, injecting risk-taking behaviour, criminal activity level, and psychiatric distress and depression level.
- **Baker, et al; Addiction: Vol 100, March 2005**

Cognitive Behavioral Therapy and Contingency Management for Stimulant Dependence

- **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** Self-reported stimulant use was reduced from baseline levels at all follow-up points for all groups and urinalysis data did not differ between groups at follow-up. While CM produced robust evidence of efficacy during treatment application, 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 appeared 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 on all measures at follow-up.
- Rawson, RA et al. *Addiction*, Jan 2006

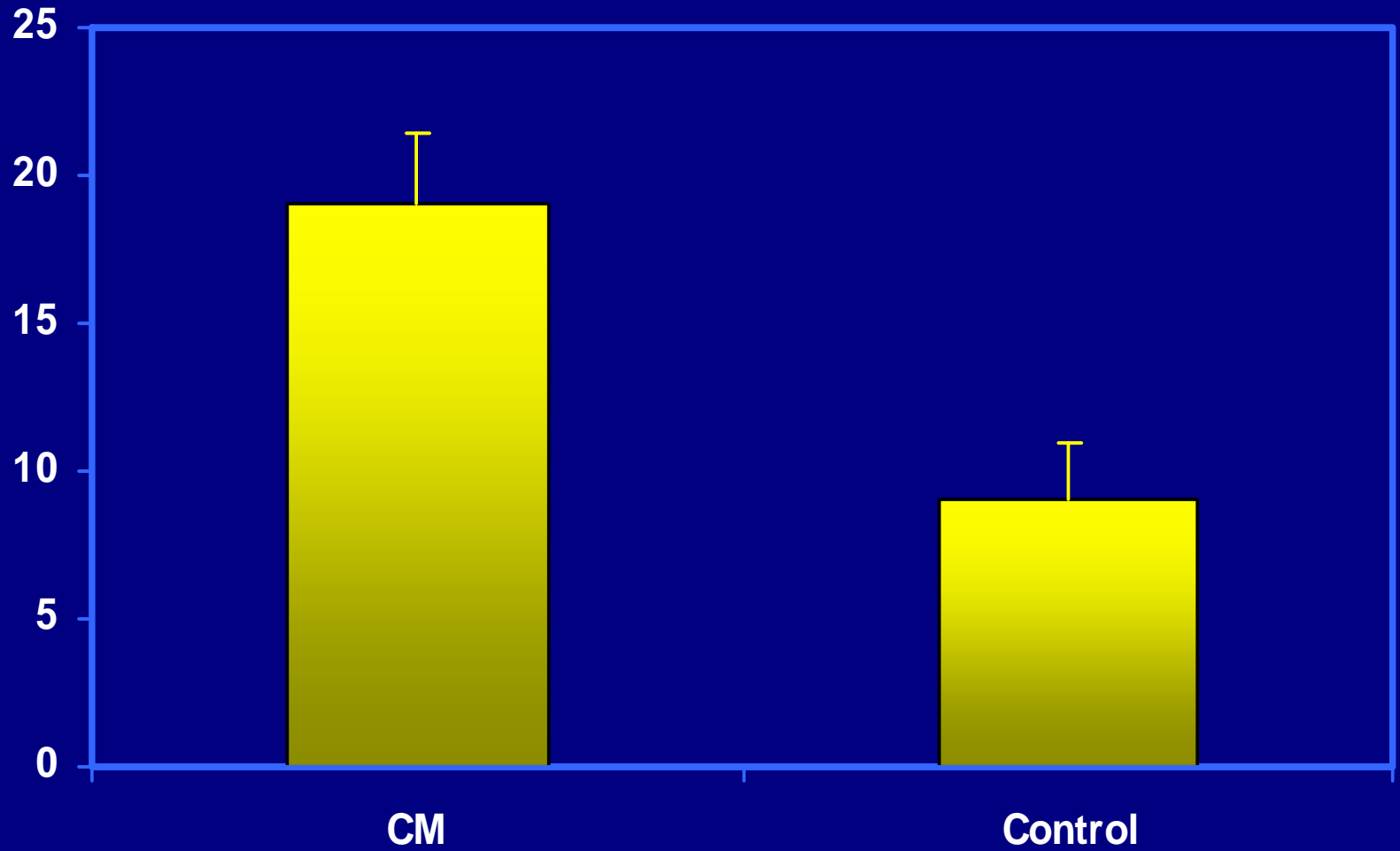
Contingency Management for treatment of methamphetamine dependence

- **Design: RTC**
- **Method: 113 patients diagnosed with methamphetamine abuse or dependence were randomly assigned to receive either treatment as usual (TAU) or TAU plus contingency management.**
- **Results indicate that both groups were retained in treatment for equivalent times but those in the combined group accrued more abstinence and were abstinent for a longer period of time. These results suggest that contingency management has promise as a component in methamphetamine use disorder treatment strategies.**
- **. Roll, JM et al, Archives of General Psychiatry, (In Press)**

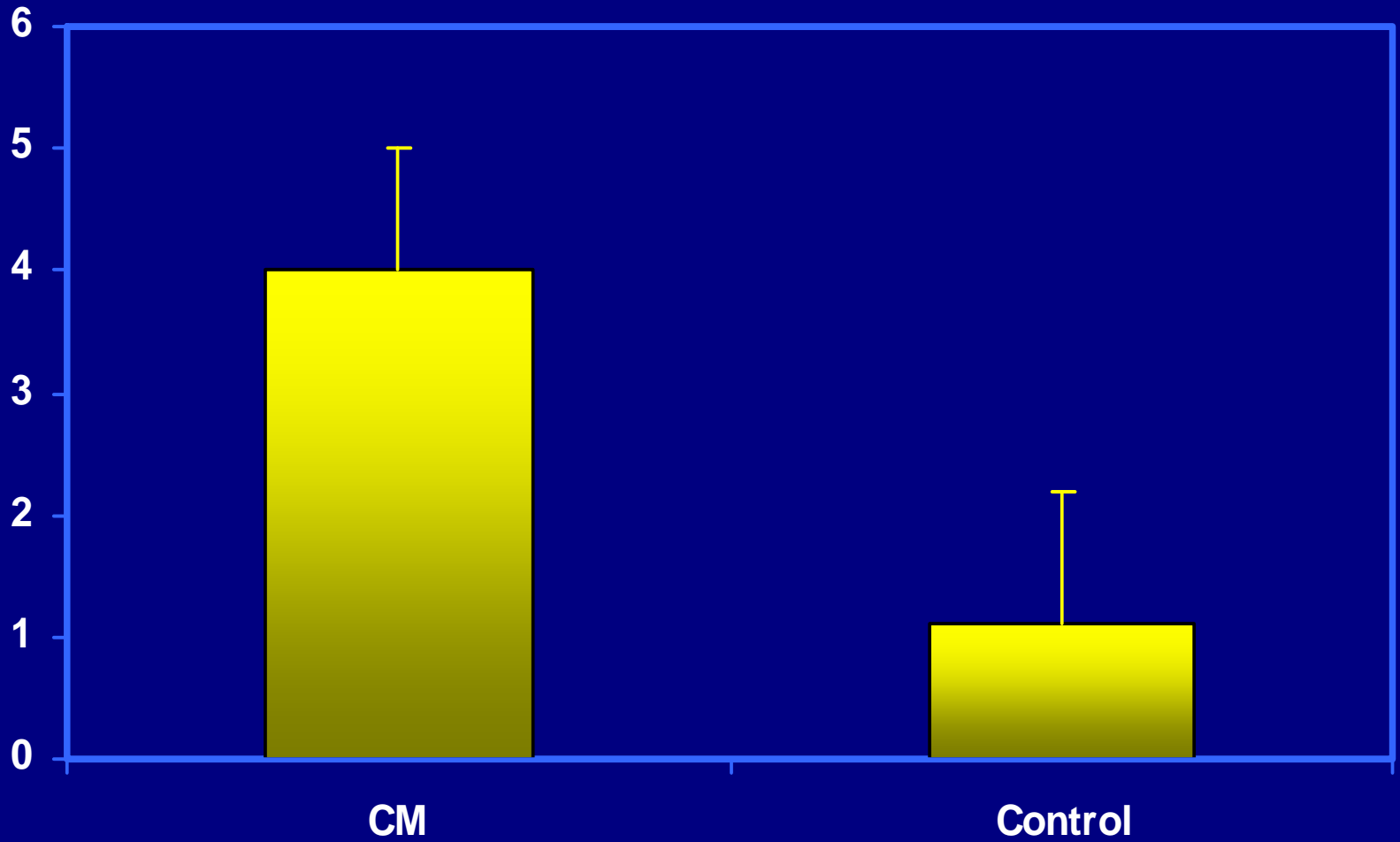
Contingency Management

- 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.

Mean number of abstinences



Mean weeks of consecutive abstinence



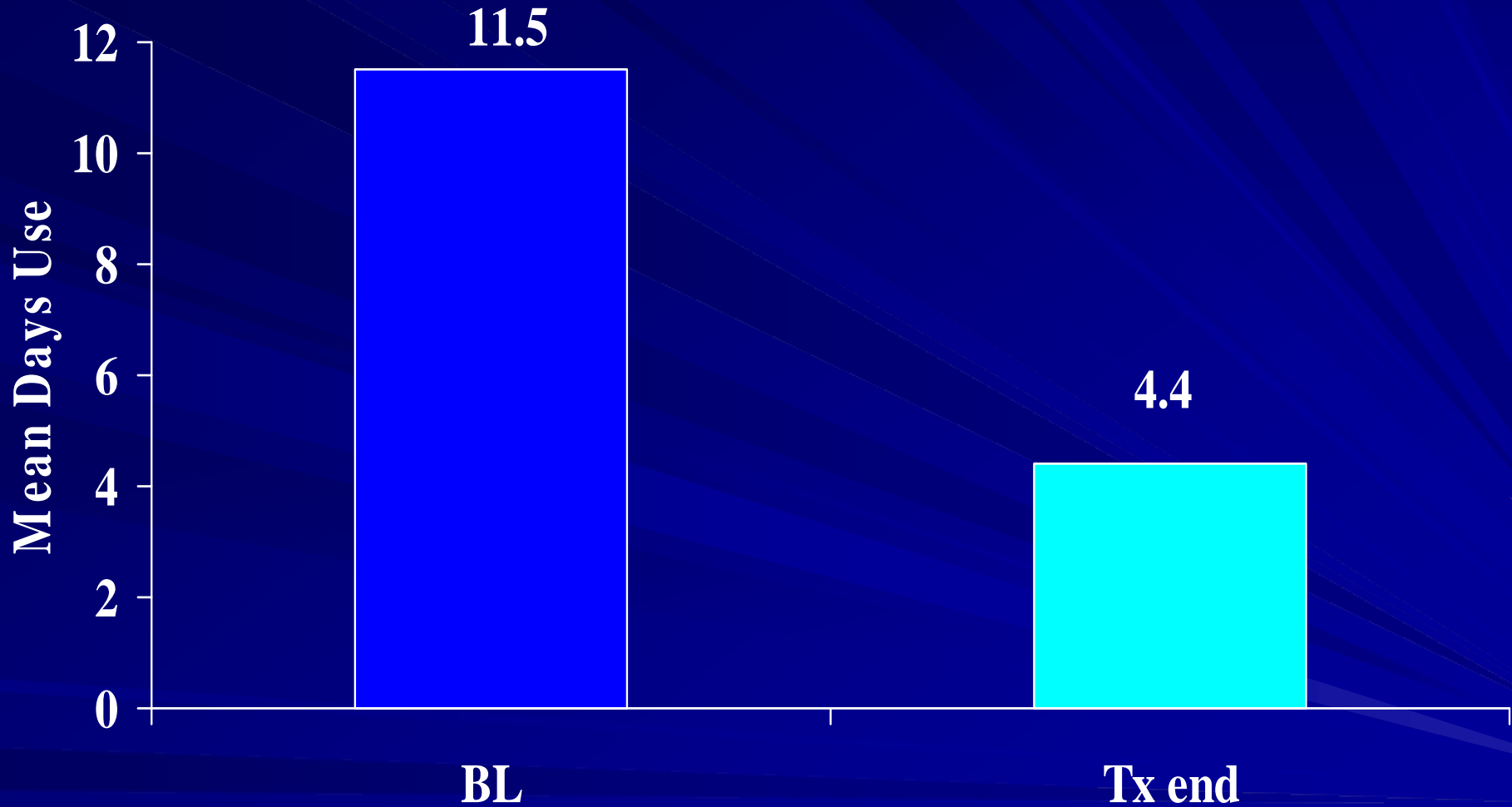
Matrix Model in Treatment of Methamphetamine Dependence

- **Design:** Randomized clinical trial.
- **Method:** 978 treatment-seeking, MA-dependent persons were randomly assigned to receive either TAU at each site, or a manualized 16-week treatment (Matrix Model) for their MA dependence.
- **Results:** Those who were assigned to Matrix treatment attended more clinical sessions, stayed in treatment longer, provided more MA-free urine samples during the treatment period, and had longer periods of MA abstinence than those assigned to receive TAU.
- **Measures of drug use and functioning** collected at treatment discharge and 6 months post-admission indicate significant improvement by participants in all sites and conditions when compared to baseline levels, but the superiority of the Matrix approach did not persist at these two time points.
- **Conclusions:** Study results demonstrate a significant initial step in documenting the efficacy of the Matrix approach. Although the superiority of the Matrix approach over TAU was not maintained at the posttreatment time points, the in-treatment benefit is an important demonstration of empirical support for this psychosocial treatment approach.
- Rawson, R et al *Addiction* vol 99, 2004

Matrix Model

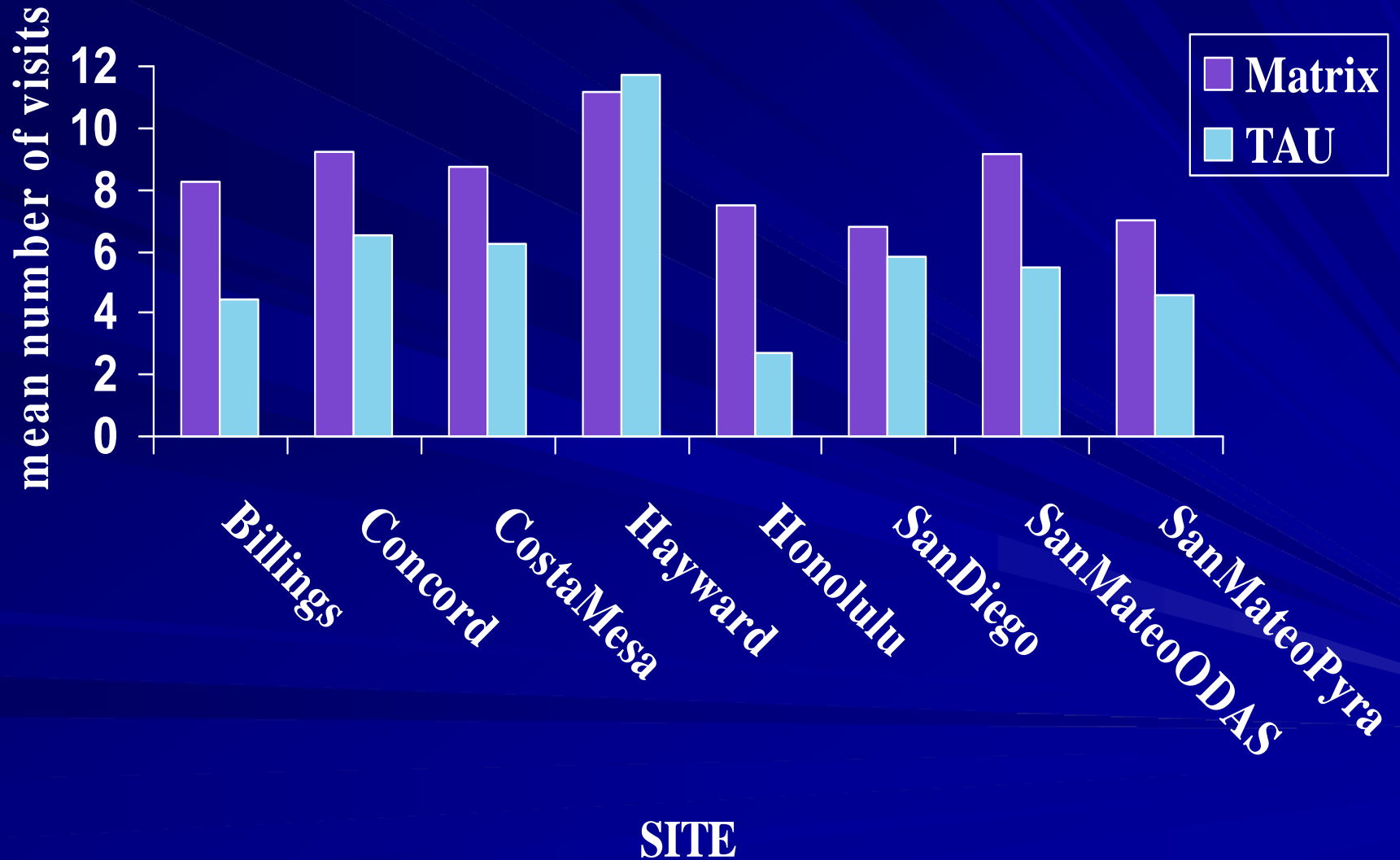
- Is a manualized, 16-week, non-residential, psychosocial approach used for the treatment of drug dependence.
- Designed to integrate several interventions into a comprehensive approach. Elements include:
 - Individual counseling
 - Cognitive behavioral therapy
 - Motivational interviewing
 - Family education groups
 - Urine testing
 - Participation in 12-step programs

Days of Methamphetamine Use in Past 30 (ASI)

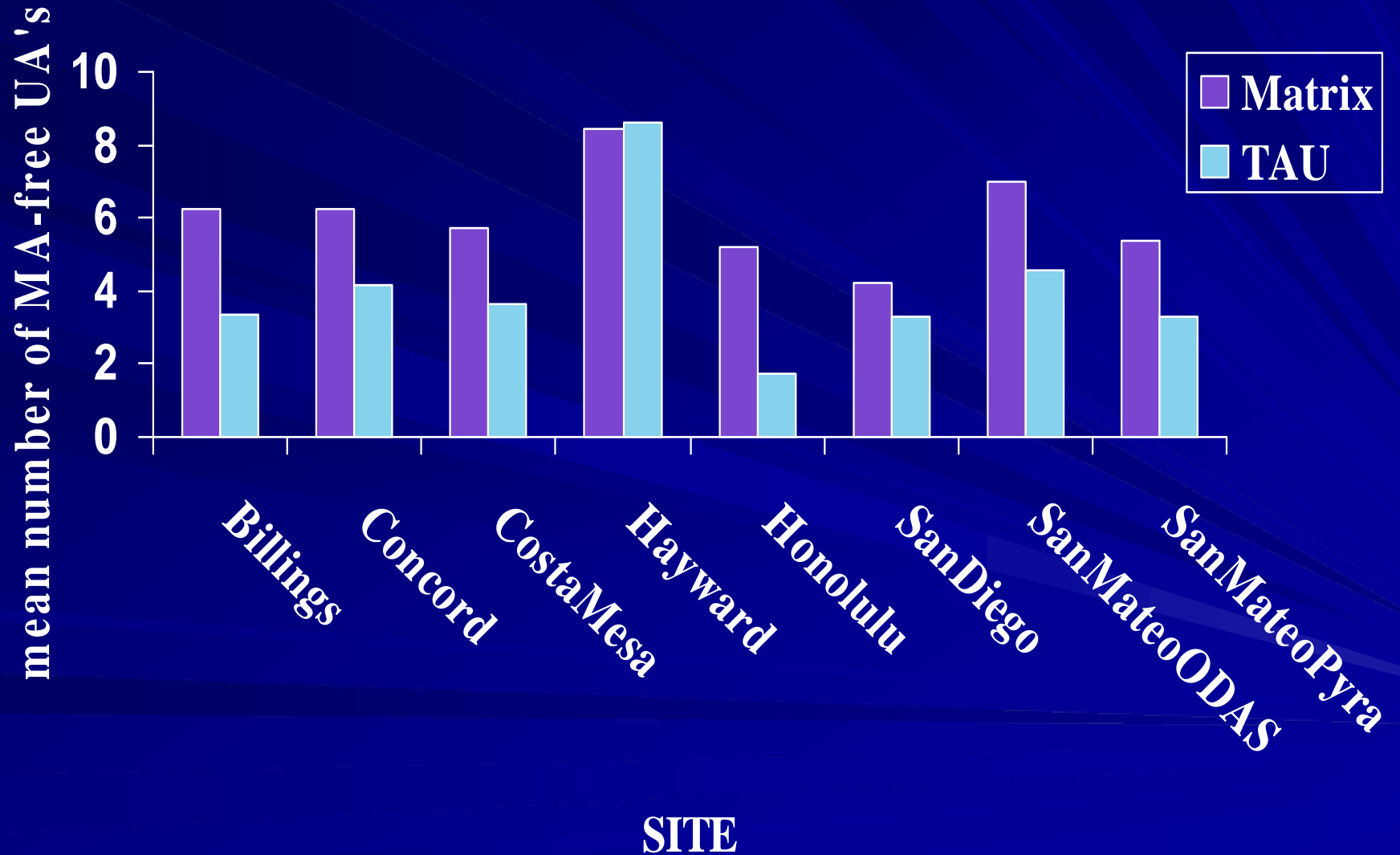


Possible is 0-30; $t_{\text{paired}}=20.90$; $p\text{-value}<0.000$ (highly sig.)

Mean Number of Weeks in Treatment



Mean Number of UA's that were MA-free during treatment



Urinalysis Results

■ Results of Ua Tests at Discharge, 6 months and 12 Months post admission **

■ Matrix Group

TAU Group

D/C: 66% MA-free

65% MA-free

6 Ms: 69% MA-free

67% MA-free

12 Ms: 59% MA-free

55% MA-free

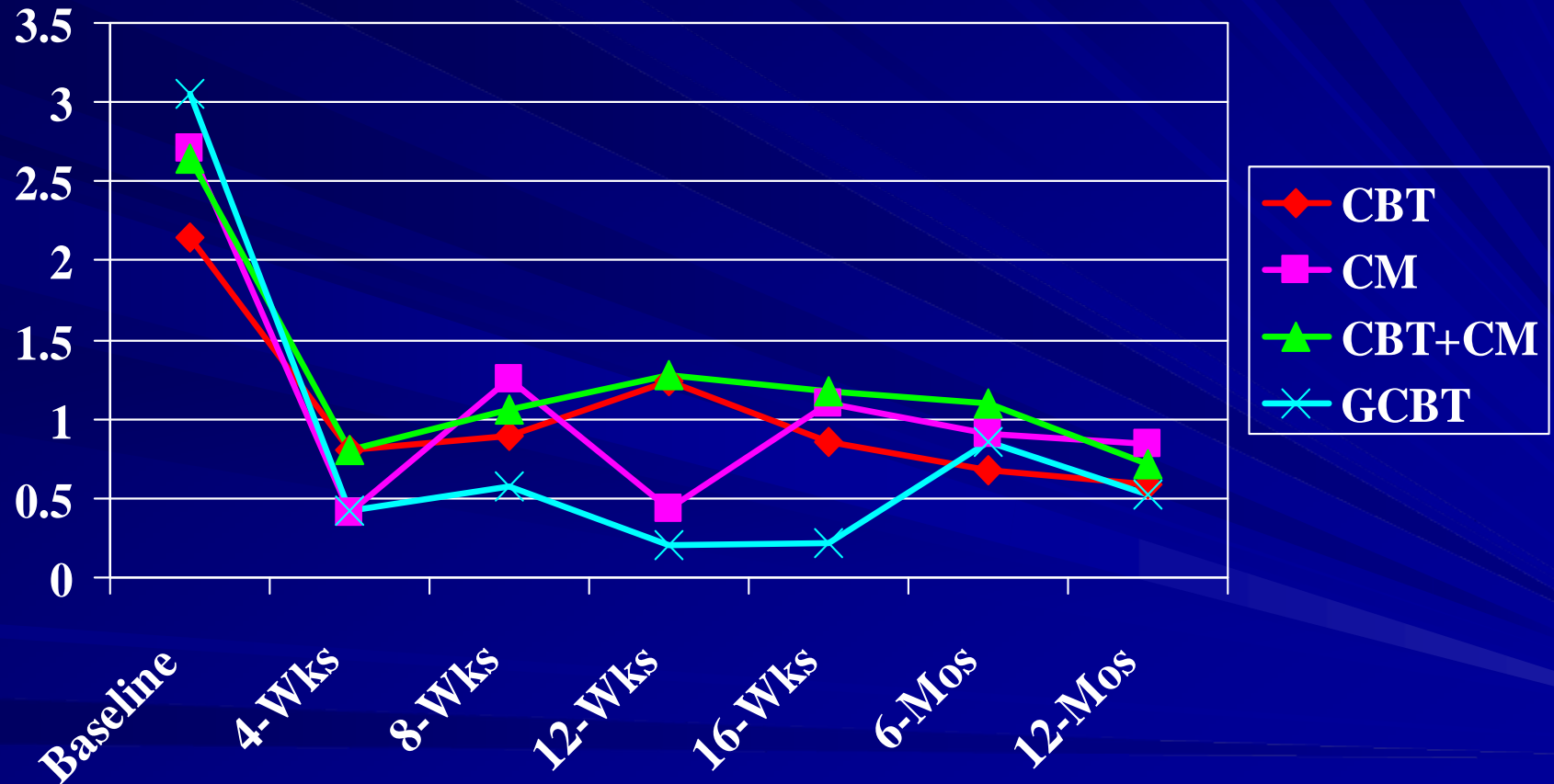
**Over 80% follow up rate in both groups at all points

MSM-specific cognitive behavioral therapy, and contingency management for the treatment of methamphetamine dependent

MSMs

- **Design:** Randomized clinical trial
- **Methods:** 162 MSM randomly assigned to one of 4 conditions; CM, CBT, CBT plus CM, MSM-specific CBT.
- **Results:** All conditions showed significant reductions in meth use by self-report and urinalysis, with CM and CM plus CBT showing significantly better reductions. Gay specific intervention also showed promise.
- **Shoptaw et al Drug and Alcohol Dependence, 79, 2005**

Sex Risks Reduced with Treatment: UARI Past 30 Days



$\chi^2_{(3)}=6.75, p<.01$

Medications

- Currently, there are no medications that can quickly and safely reverse life threatening MA overdose.
- There are no medications that can reliably reduce paranoia and psychotic symptoms, that contribute to episodes of dangerous and violent behavior associated with MA use.

Status of Medication Research for Methamphetamine Dependence

Negative Results

- Imipramine
- Desipramine
- Tyrosine
- Ondansetron
- Fluoxetine

Under Consideration

Gabapentin
Modafinil
Topiramate
Disulfiram
Lobeline
Aripiprazole

Promising Evidence: Bupropion; Methylphenidate
SR

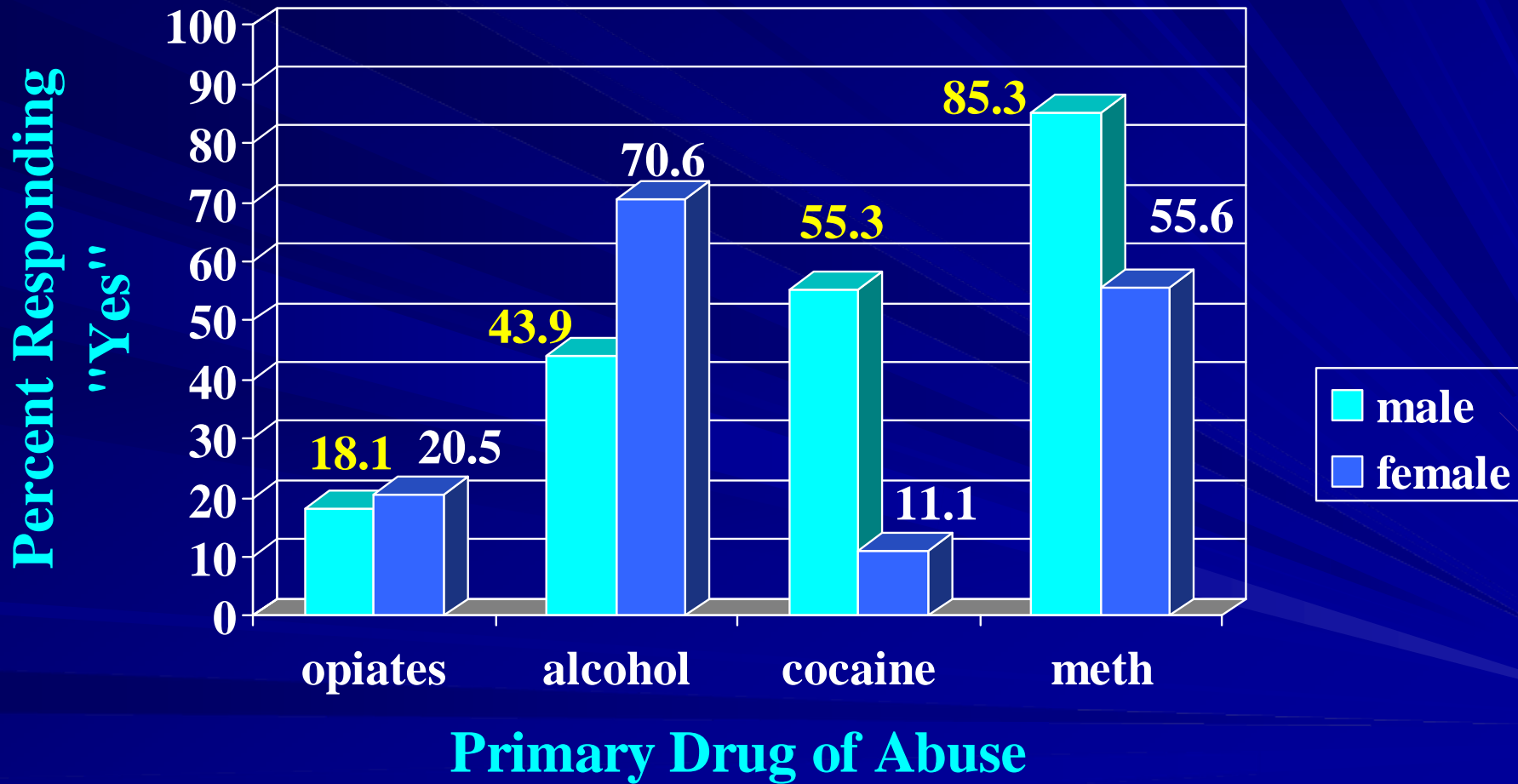
Promising Pharmacotherapies?

- **Newton, T. et al (Biological Psychiatry, Dec, 2005) Bupropion reduces craving and reinforcing effects of methamphetamine in a laboratory self-administration study.**
- **Elkashef, A. et al (recently completed; reported at the ACNP methamphetamine satellite meeting in Kona, Hawaii) Bupropion reduces meth use in an outpatient trial, with particularly strong effect with less severe users.**
- **Tiihonen, J. et al (recently completed; reported at the ACNP methamphetamine satellite meeting in Kona, Hawaii) Methylphenidate SR (sustained release) has shown promise in a recent Finnish study with very heavy amphetamine injectors.**

Methamphetamine

Methamphetamine and Sex

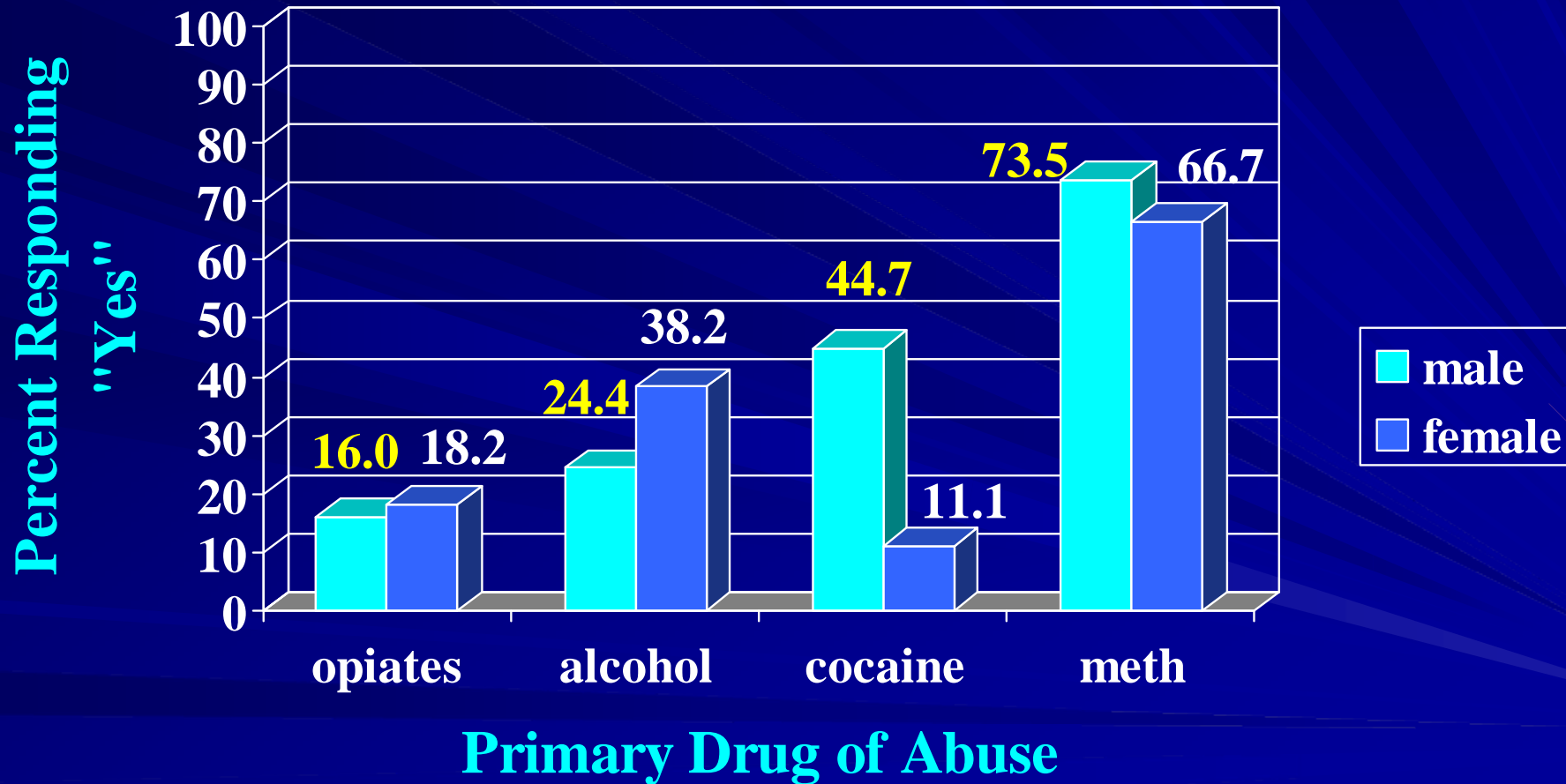
My sexual *drive* is increased by the use of ...



(Rawson et al., 2002)

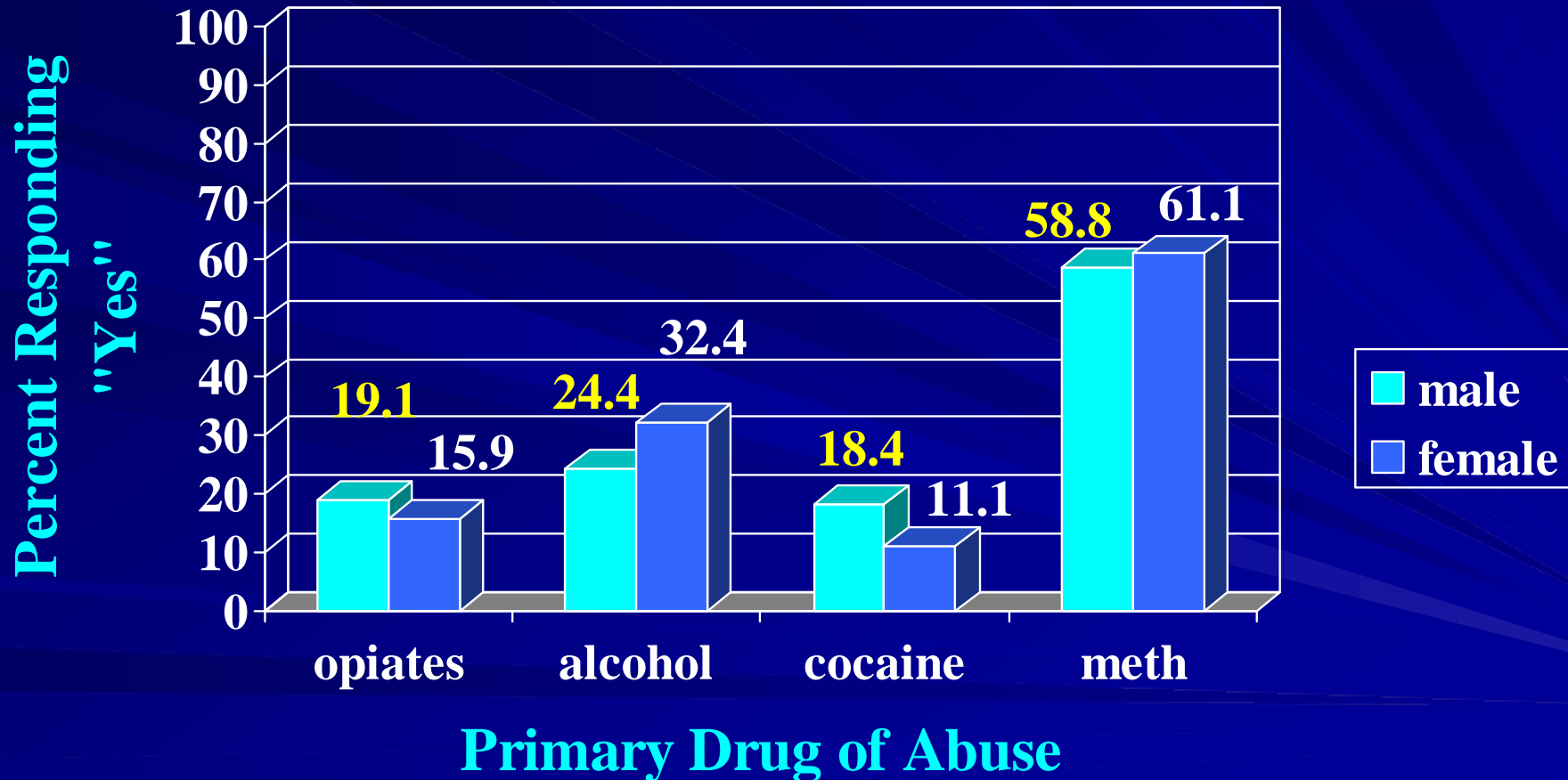
My sexual *pleasure* is enhanced by the use of

...



My sexual performance is improved by the use of

...

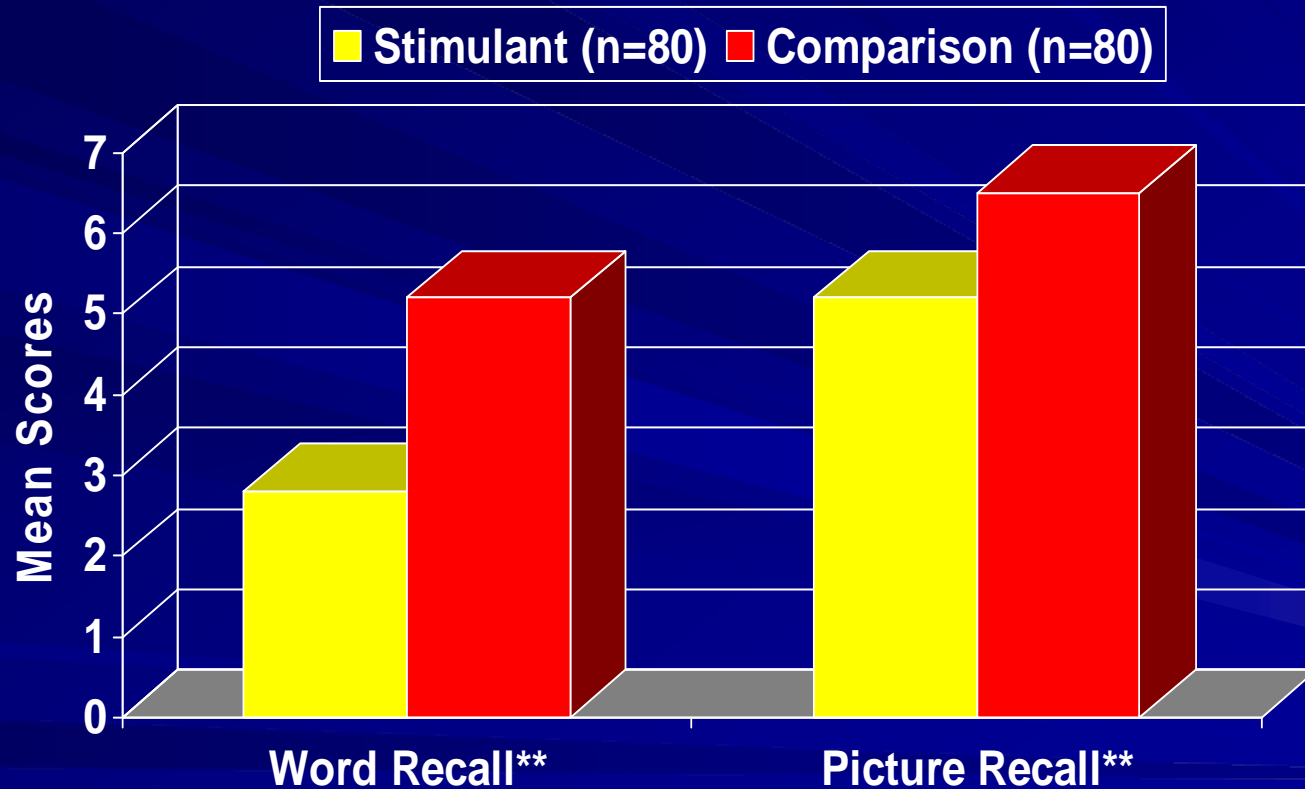


(Rawson et al., 2002)

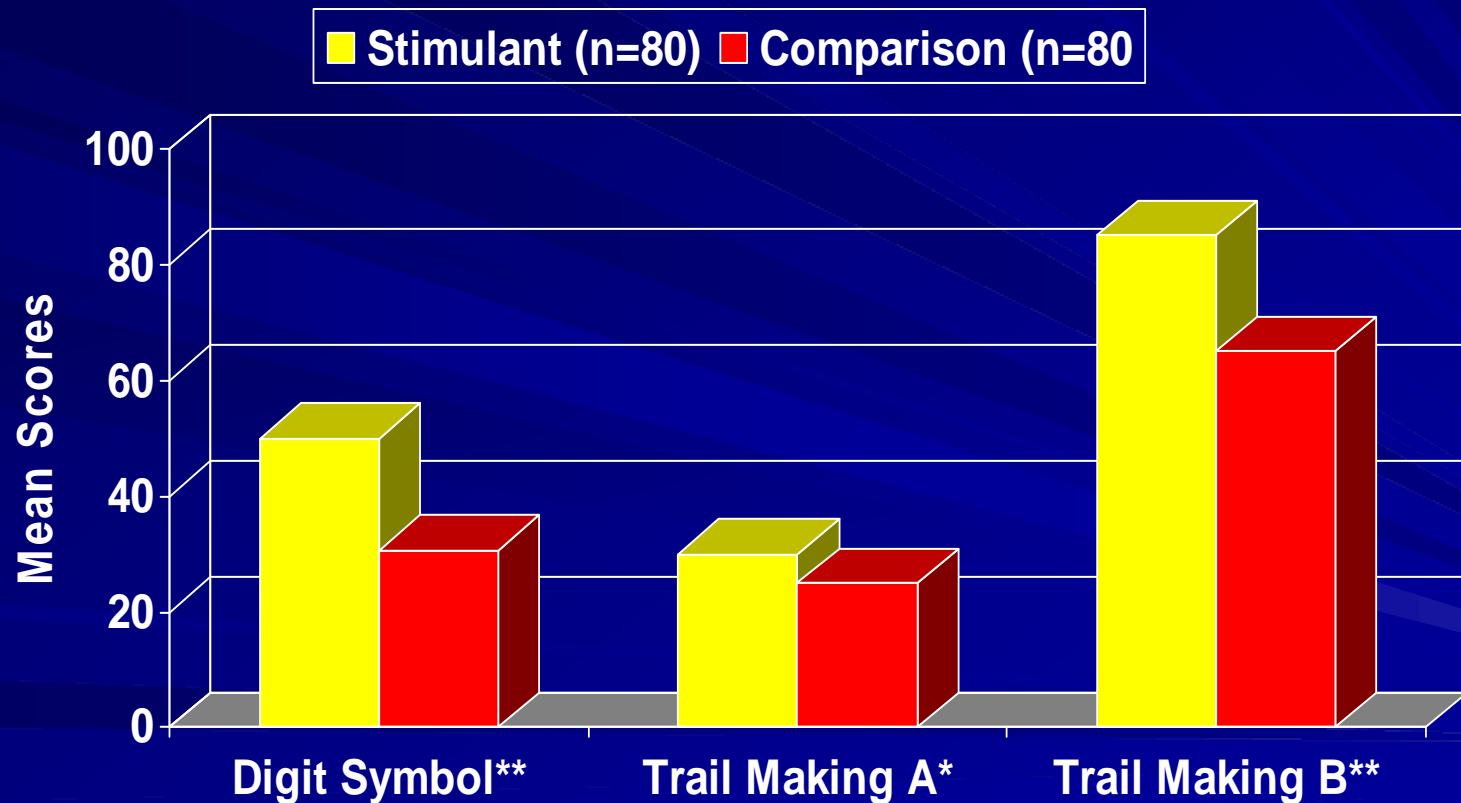
Methamphetamine

Cognitive and Memory Effects

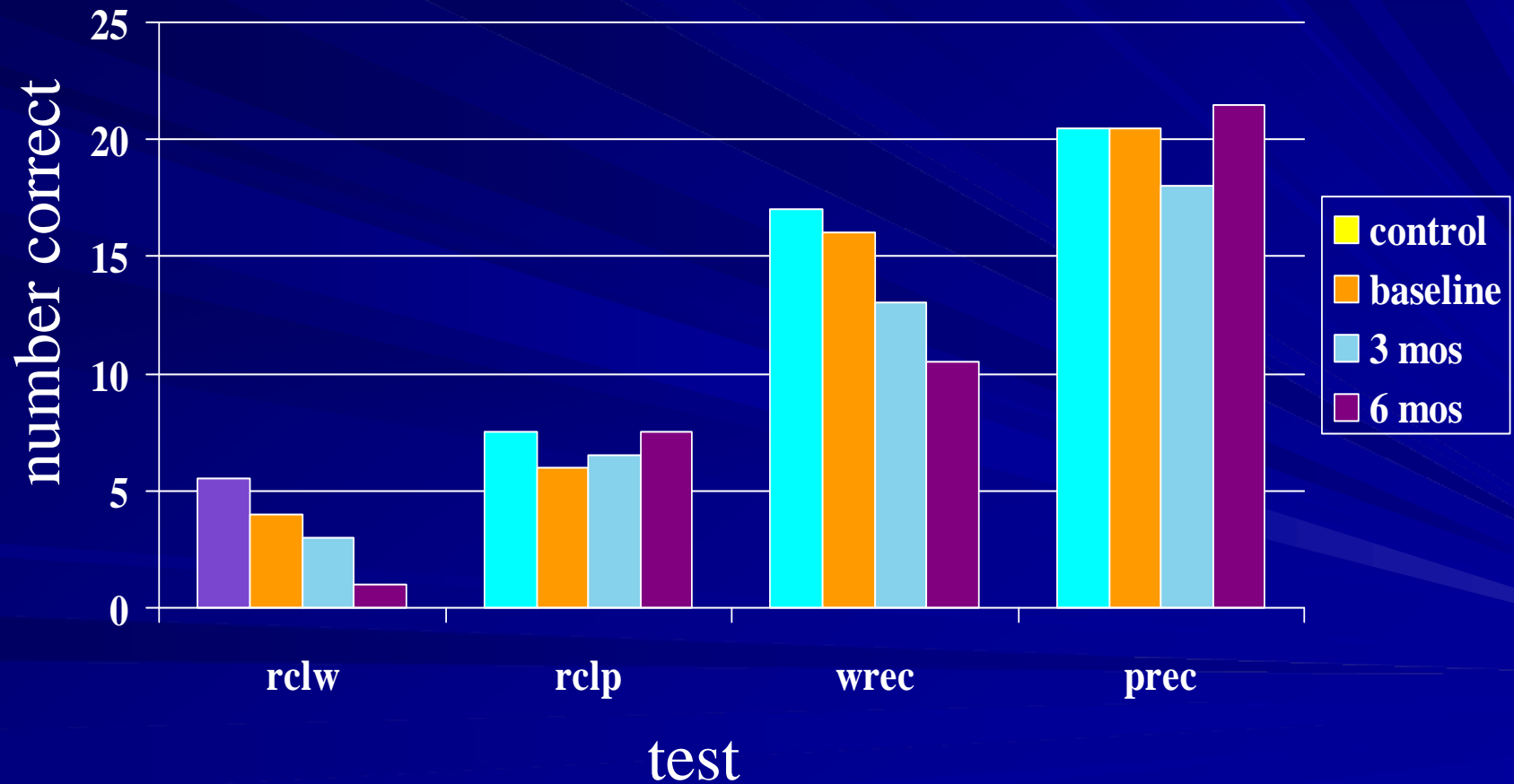
Memory Difference between Stimulant and Comparison Groups



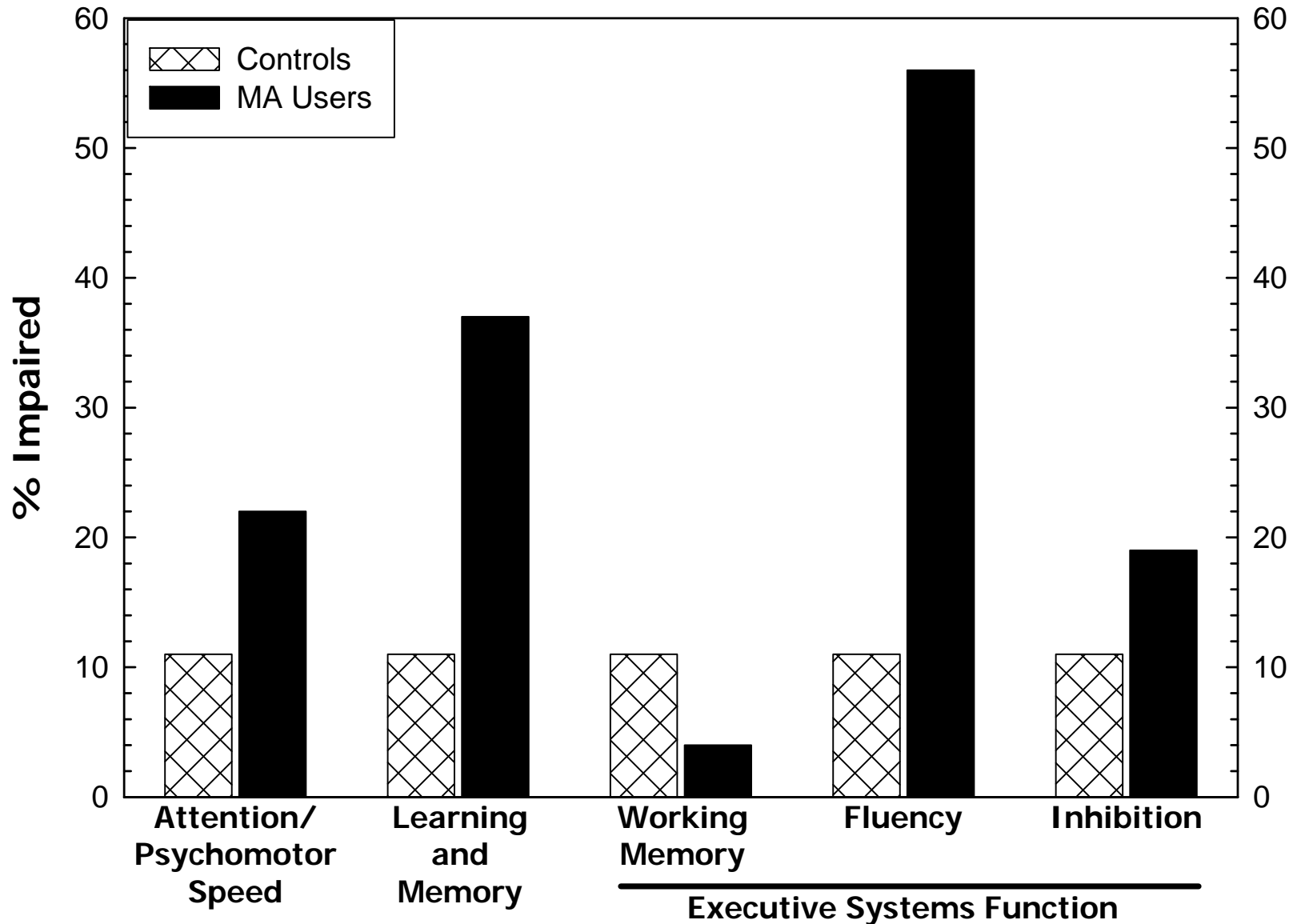
Differences between Stimulant and Comparison Groups on tests requiring perceptual speed



Longitudinal Memory Performance



Frequency of Impairment by Neuropsychological Domain



Defining Domains: Executive Systems Functioning

- a.k.a. frontal lobe functioning.
- Deficits on executive tasks assoc. w/:
 - Poor judgment.
 - Lack of insight.
 - Poor strategy formation.
 - Impulsivity.
 - Reduced capacity to determine consequences of actions.

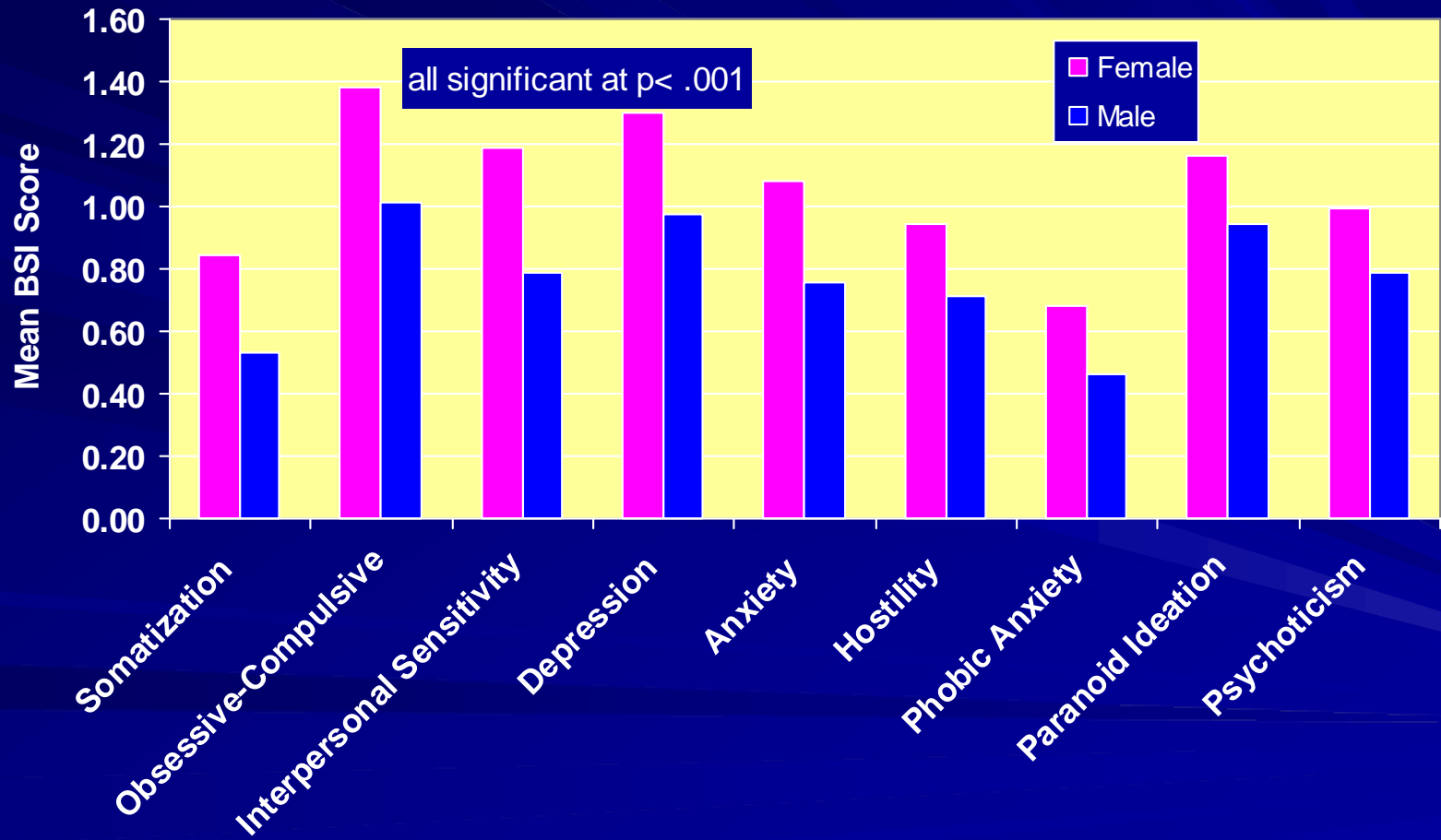
Methamphetamine

Gender Differences

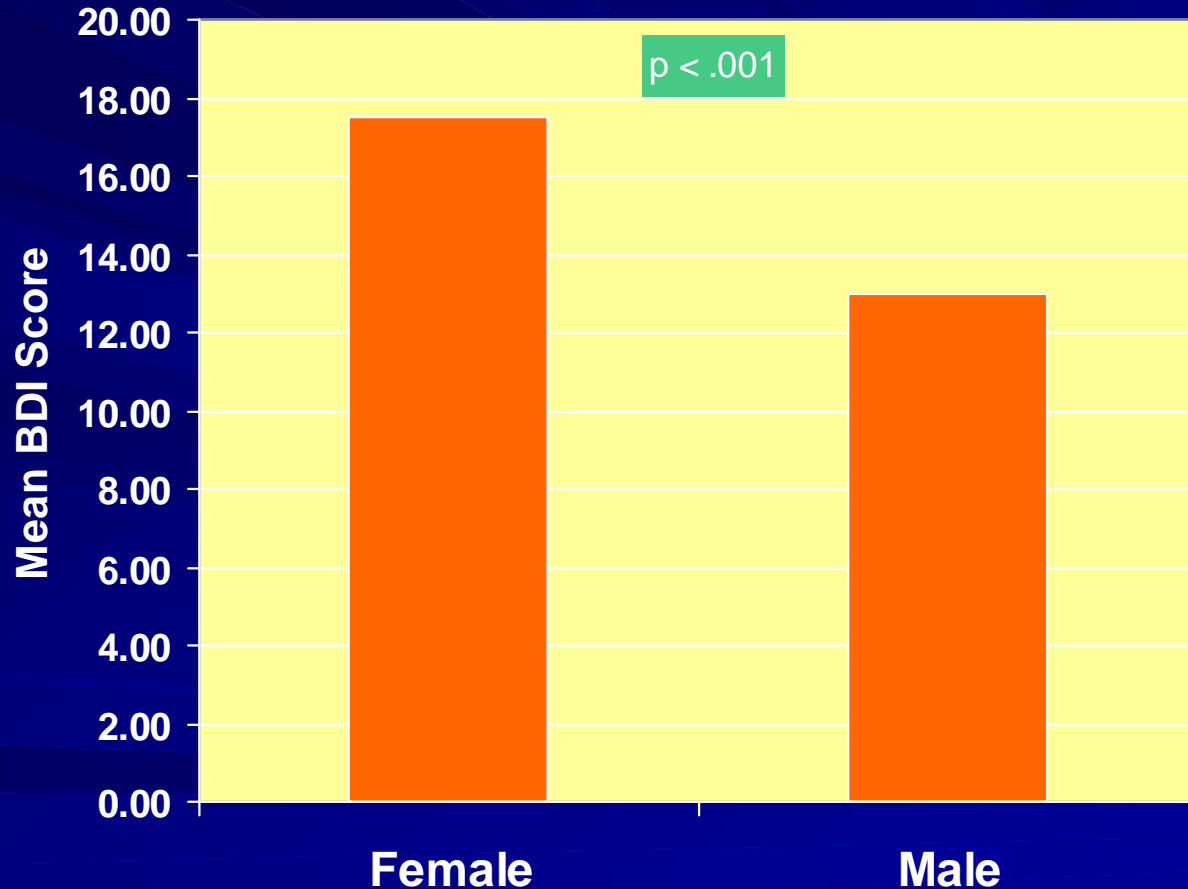
Women's Issues

Craving

Behavior Symptom Inventory (BSI) Scores at Baseline



Beck Depression Inventory (BDI) Scores at Baseline



Self-Reported Reasons for Starting Methamphetamine Use



Female Methamphetamine Users: Social Characteristics and Sexual Risk Behavior

**Semple SJ, Grant I, Patterson TL
Women and Health
Vol. 40(3), 2004**

Demographics (n=98)

■ Ethnicity

- 44% Caucasian
- 33% African American
- 16% Latina
- 2% Native American
- 5% Other

■ Education

- 96% had less than a college education

■ Marital Status

- 54% had never been married

■ Employment

- 77% were unemployed

Demographics

■ Psychiatric Health Status

- 38% reported having a psychiatric diagnosis
 - 53% depression
 - 17% bipolar
 - 14% schizophrenia

■ Patterns of Use

- 83% smoked

■ Context of Meth Use

- Meth was used primarily with either a friend (95%) or a sexual partner (84%).

■ Social and Legal Problems

- 36% reported having a felony conviction.

Reasons for Meth Use

- Reasons for using meth were wide-ranging:
 - To get high (56%)
 - To get more energy (37%)
 - To cope with mood (34%)
 - To lose weight/feel more attractive (29%)
 - To party (28%)
 - To escape (27%)
 - To enhance sexual pleasure (18%)

Sexual Partners of Meth-Using Women

- On average women had 7.8 sexual partners in a two-month period (SD=10.7, range 1-74).
- 84% had casual partners during the past two months.
 - 90% of all casual partners were reported to be meth users.
- 31% had an anonymous partner in the past two months.
 - 76% of anonymous sex partners were meth users.
- No spouses or live-in partners were reported to be HIV-positive.

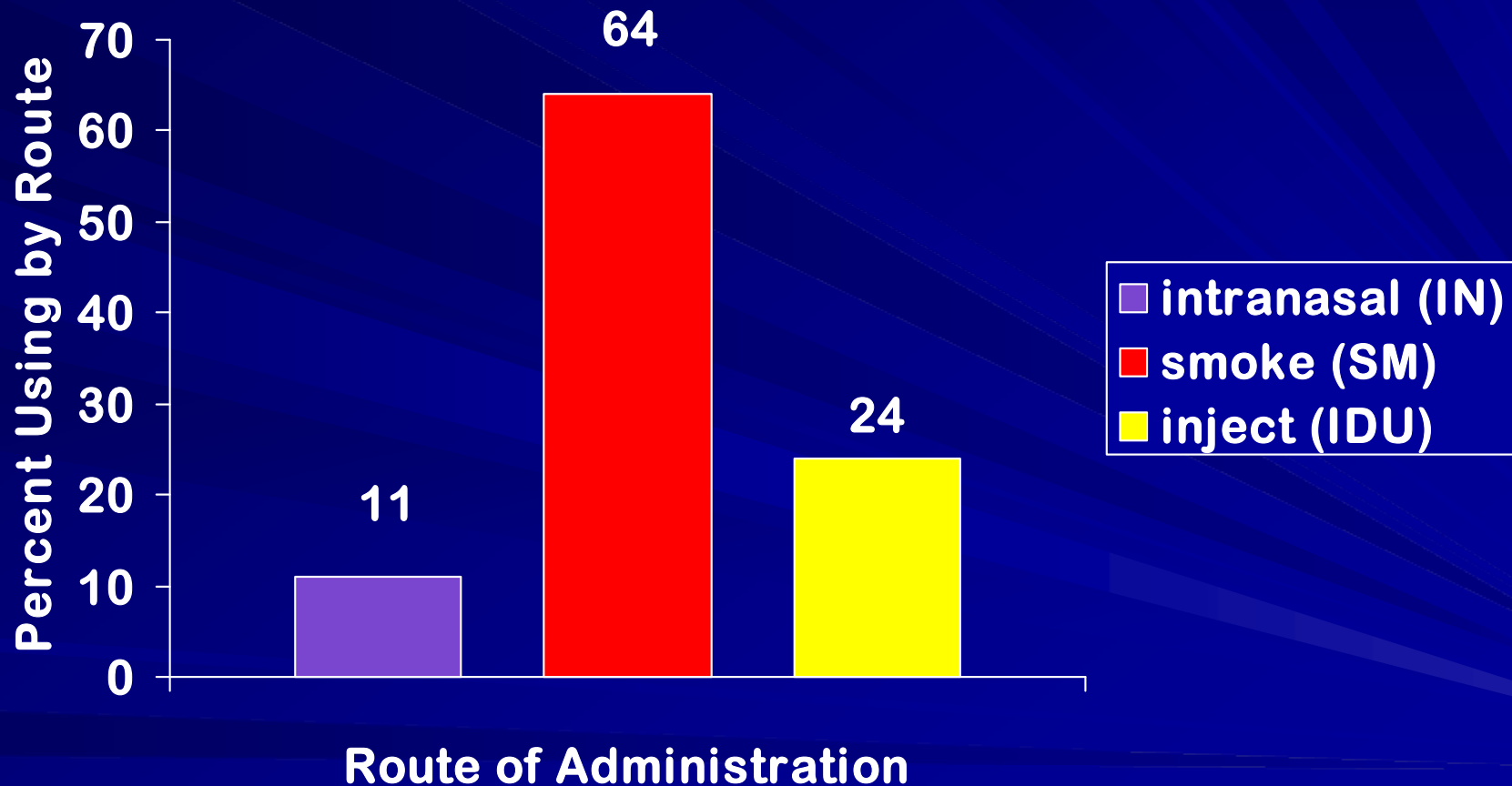
Sexual Risk Behavior

- Participants engaged in an average of 79.2 sex acts over a two-month period.
- Most sexual activity was unprotected. The average number of unprotected and protected sex acts over the two-month period was 70.3 and 8.8, respectively.
- In terms of unprotected sex:
 - 56% of all vaginal sex acts were unprotected
 - 83% of all anal sex acts were unprotected
 - 98% of all oral sex acts were unprotected

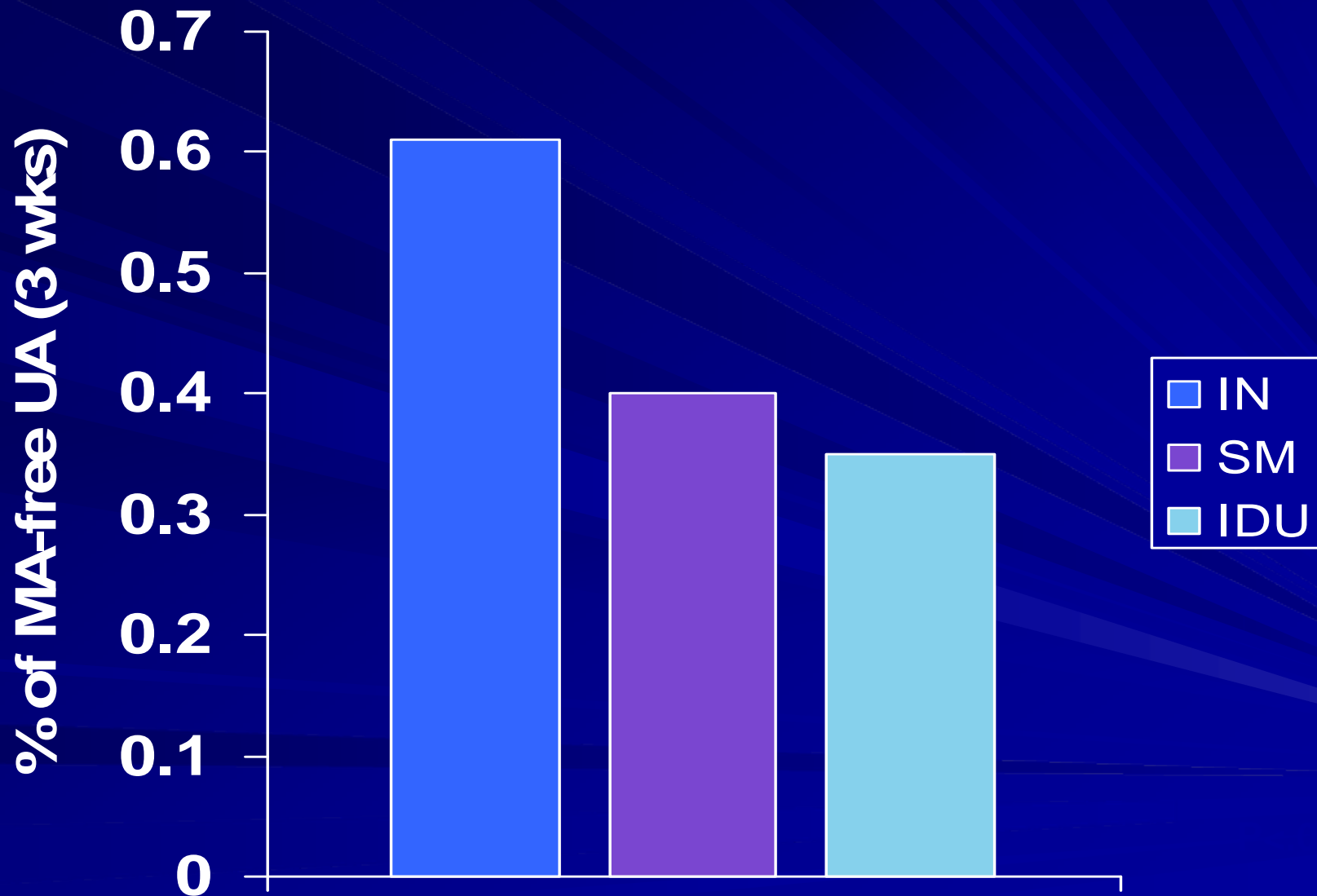
Methamphetamine

Route of Administration

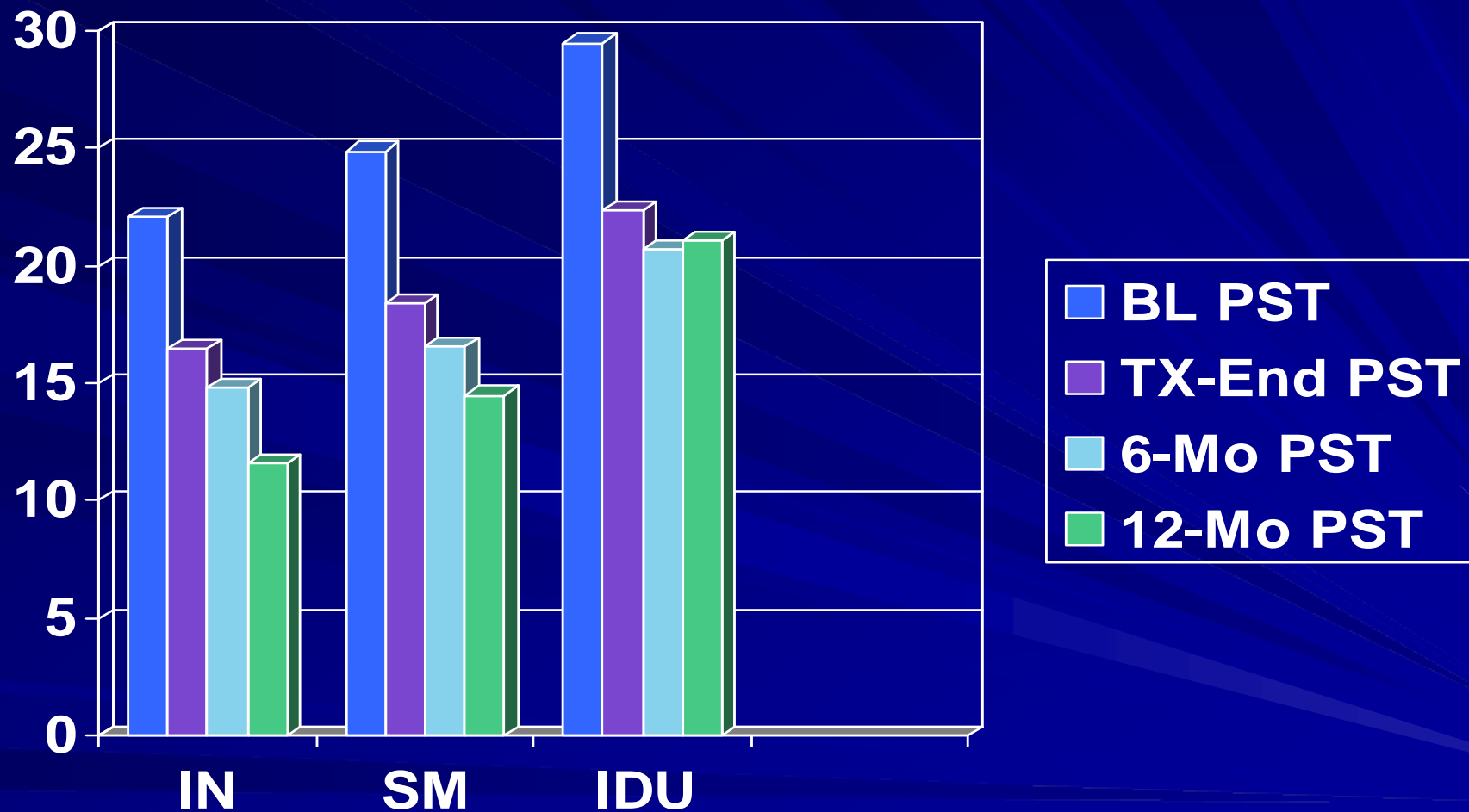
Route of Methamphetamine Administration



MA-Free Samples by Route



BSI Psychiatric Symptoms by Route



Positive Symptom Total (PST)

Prevalence of Hepatitis C in the U.S.

- Hepatitis C is the most common blood borne infection in the United States (CDC, 1998).
- Hepatitis C virus (HCV) is efficiently transmitted via injection drug use, which is the primary risk factor for acquiring HCV (CDC, 2003).
- The vast majority of injecting drug users in the United States already are infected with HCV (Hagan et al., 2001) with prevalence estimates of 90% infection among individuals who injected for 5 or more years (Garfein et al., 1996).

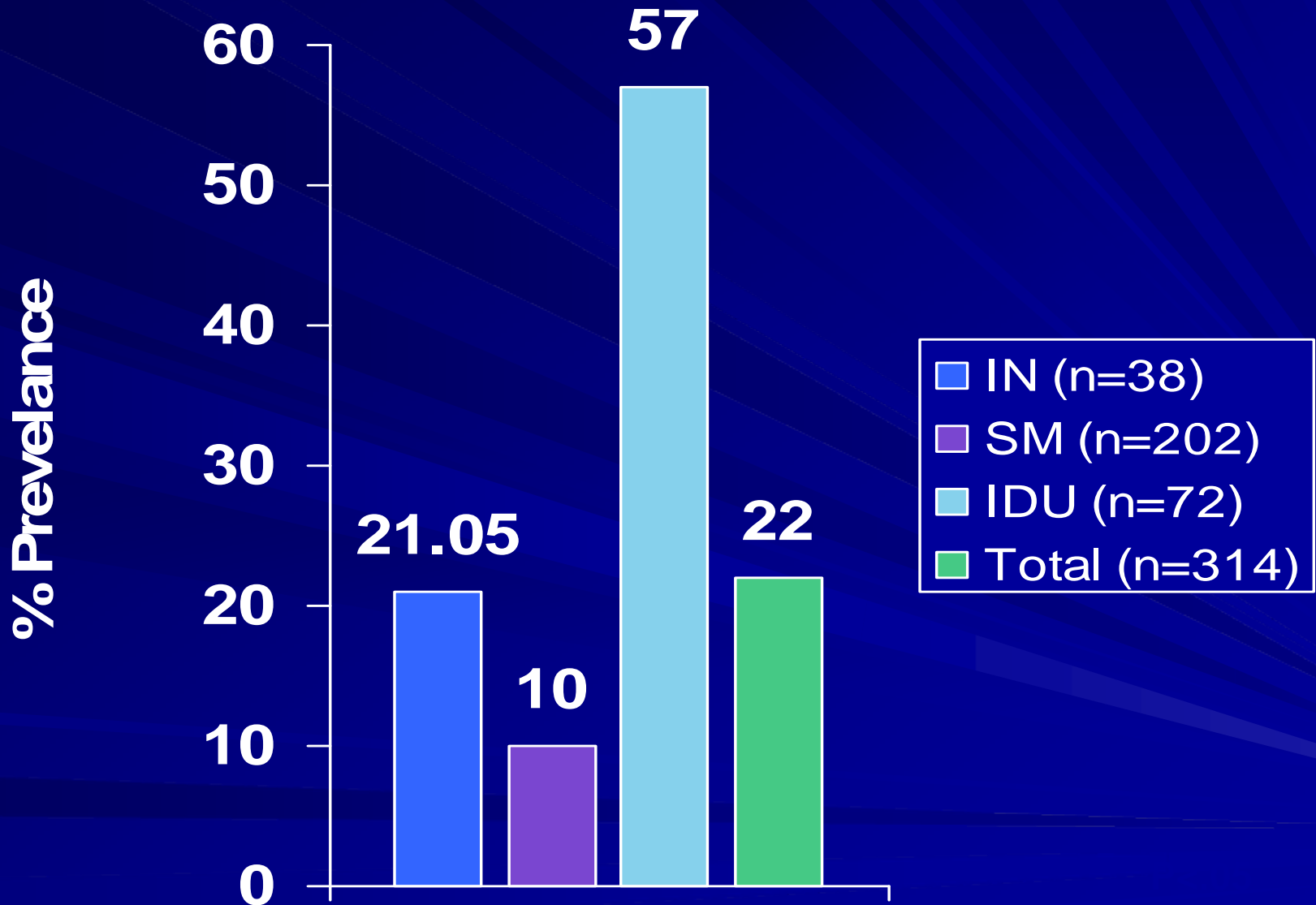
Hepatitis C and IV Drug Use: Why Does it Matter?

- IDUs are largest group of HCV infected persons in U.S.
- Approximately 1 million IDUs infected
- Highest prevalence (80-90%) and incidence (10-20%)
- Source of most HCV transmission
- HCV and substance use ***CAN be treated together.***

How Does Injection Drug Use Lead to Hepatitis C Transmission?

- Transfer of HCV-infected blood by sharing needles/syringes
- Contamination of drug preparation equipment
- Hepatitis C infection is acquired more rapidly after initiation of injection drug use than other viral infections (such as HIV and hepatitis B)

Hepatitis C by Route



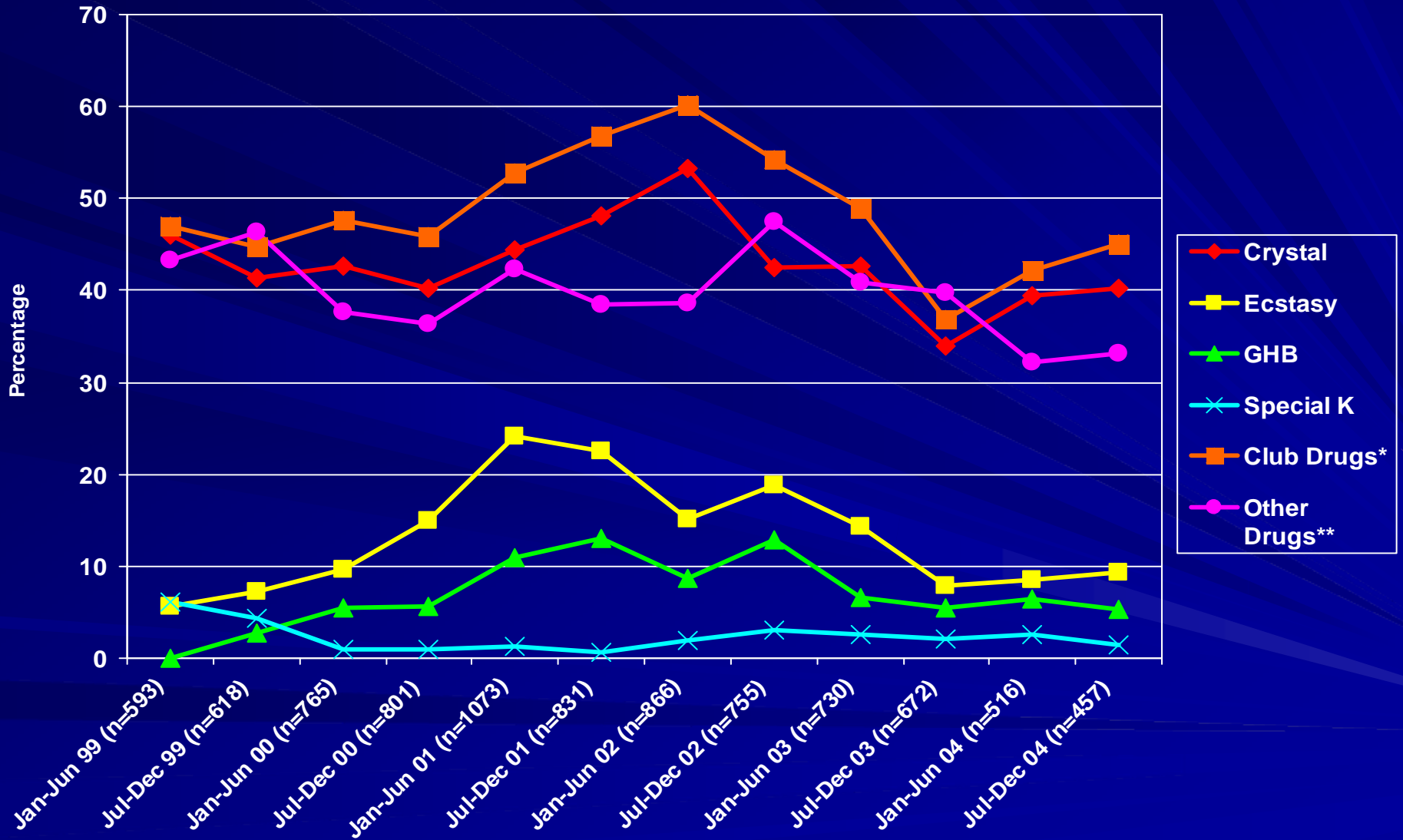
Motivations Associated with Meth Use among HIV+ MSM

- Meth makes sex more pleasurable
- Meth facilitates sexual experimentation
- Meth helps participants to cope with an HIV+ diagnosis
- Meth use provides a temporary escape from being HIV+
- Meth use helps the individual to manage negative self-perceptions and social rejection associated with being HIV+

Club Drug Trends

Gay and Bisexual Male Substance Users

Jan 1, 1999 – Dec 31, 2004



*All club drugs (includes combination of crystal, ecstasy, GHB, special K) **Other drugs (includes cocaine, crack, amyl nitrate, barbiturates)

Other Data on Meth-Using MSM

- The following data is based on a sample of 90 HIV+ meth-using MSM:
 - 46% identified as “binge” users
 - Average binge lasted 5.6 days
 - Binge users reported significantly more social difficulties, sexual risk behaviors, and mental and physical health problems

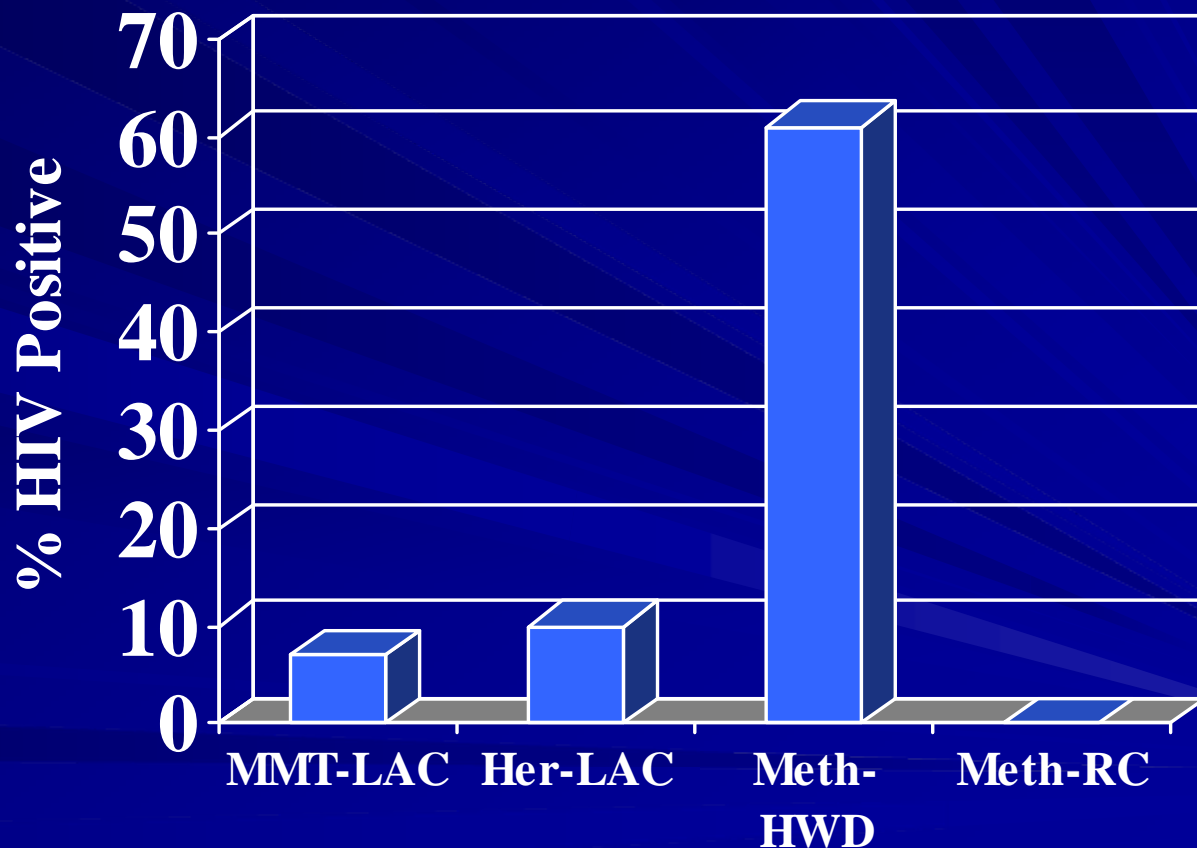
Exposure Risks by Geography, 2002

	MSM	IDU	MSM+ IDU	Het	Other
LA	71.3%	7.0%	6.6%	4.6%	10.4%
SF	74.3%	8.8%	13.5%	1.7%	1.7%
Bakersfield	42.7%	28.4%	12.4%	10.3%	6.2%
Rvrsd/SnBrn	61.1%	14.4%	10.2%	6.8%	8.1%
NYC	29.5%	41.5%	3.2%	9.8%	16.0%

CDC, WONDER, 2004

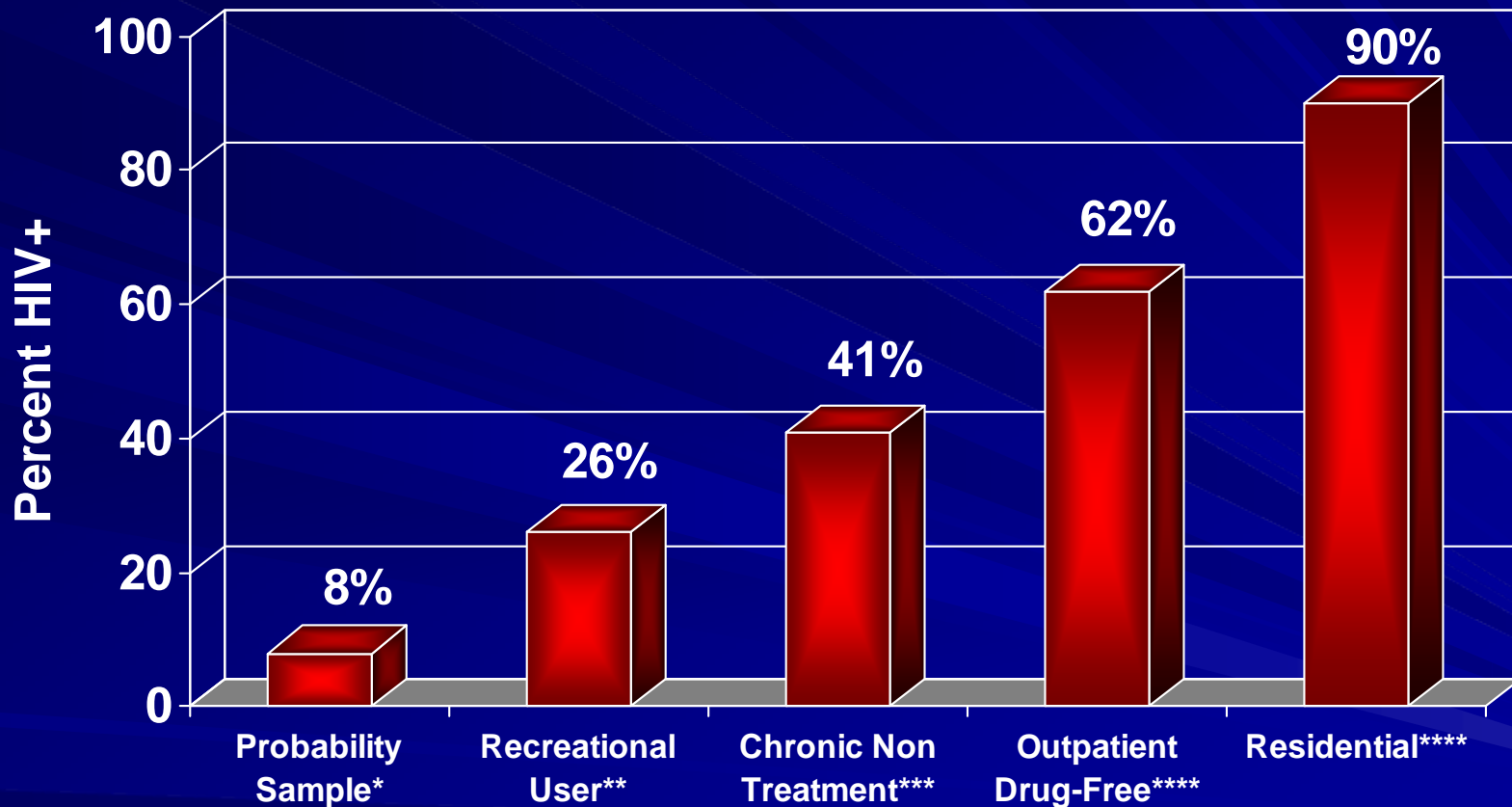
Local Prevalence Data Sharpens Understanding of HIV Epidemic

In Los Angeles County, heroin injectors at low risk; gay male meth users at extreme risk



LAC HIV Epi (1999-2004); UCLA/ISAP (1998-2004)

Methamphetamine and HIV in MSM: A Time-to-Response Association?



* Deren et al., 1998; Molitor et al., 1999

** Reback, 1997; *** Shoptaw et al., 1997

Treatment as Prevention

- Substantial HIV risk decreases with Rx
- Reductions begin soon after Rx starts
- Lapses to unsafe sex are common
- Individual factors can affect outcomes
- AIDS prevention programs cannot reach all at risk

Stall et al., 1999

Methamphetamine Use and HIV Risk Behaviors Among Heterosexual Men – Preliminary Results from Five Northern California Counties, December 2001 – November 2003*

*

Methamphetamine Use and HIV Risk Behaviors Among Heterosexual Men - Preliminary Results from Five Northern California Counties, December 2001 – November 2003. *Morbidity and Mortality Weekly Report*. 2006;55:273-277.

Objective of Study

- Assess the association between methamphetamine (MA) use and high-risk sexual behaviors among heterosexual men

Methods

■ Participants

- 1,011 men completed interviews
 - Living in low-income neighborhoods of Alameda, Contra Costa, San Francisco, San Joaquin, and San Mateo counties in northern California
 - 18-35 years old
 - Analyses in this report were restricted to men who reported having female sex partners exclusively during the preceding 6 months, leaving 968 participants

Methods Continued

- Staff-Administered Interviews
 - Sexual-activity matrix
 - Information recorded of up to 10 partners during the preceding 6 months
 - Sex and category of each sex partner
 - Vaginal or anal intercourse
 - Use of condoms

Methods Continued

- Staff-Administered Interviews Continued
 - Self-reported MA use (recent use and historical use)
 - Self-report of ever having been tested for HIV or chlamydial infection
 - Self-report of ever giving or receiving money or drugs for sex or of having been forced into sex

Results

- Recent MA users were more likely than men who had never used MA to:
 - Be sexually active with a female partner
 - Have multiple female partners
 - Have a casual or anonymous female partner
 - Have anal intercourse with a casual or anonymous female partner
 - Have a female partner who injected drugs
 - Have ever received money or drugs for sex from a male or female partner

Results Continued

	Recent MA use n = 58		Never used MA n = 817	
	No.	(%)	No.	(%)
Sexually active, past 6 mos	54	93.1	583	72.2
Anal sex with a female, past 6 mo	16	29.6	69	11.9
Casual or anonymous female partner	35	64.8	259	44.4
No. of female partners				
1	21	38.9	367	63.1
2	18	33.3	87	14.8
3 to 5	9	16.7	100	17.2
>5	6	11.1	28	4.8
Partner who injected drugs	6	11.1	13	1.7
Ever received money or drugs for sex	9	15.5	28	3.5

Implications of Results

- The growing prevalence of HIV among heterosexuals, together with the increased use of MA nationwide and the findings of this study, suggest the potential for MA to influence heterosexual transmission of HIV
- Suggests the need for states to consider including referrals to MA prevention and treatment programs in their HIV prevention programs



Sample Characteristics

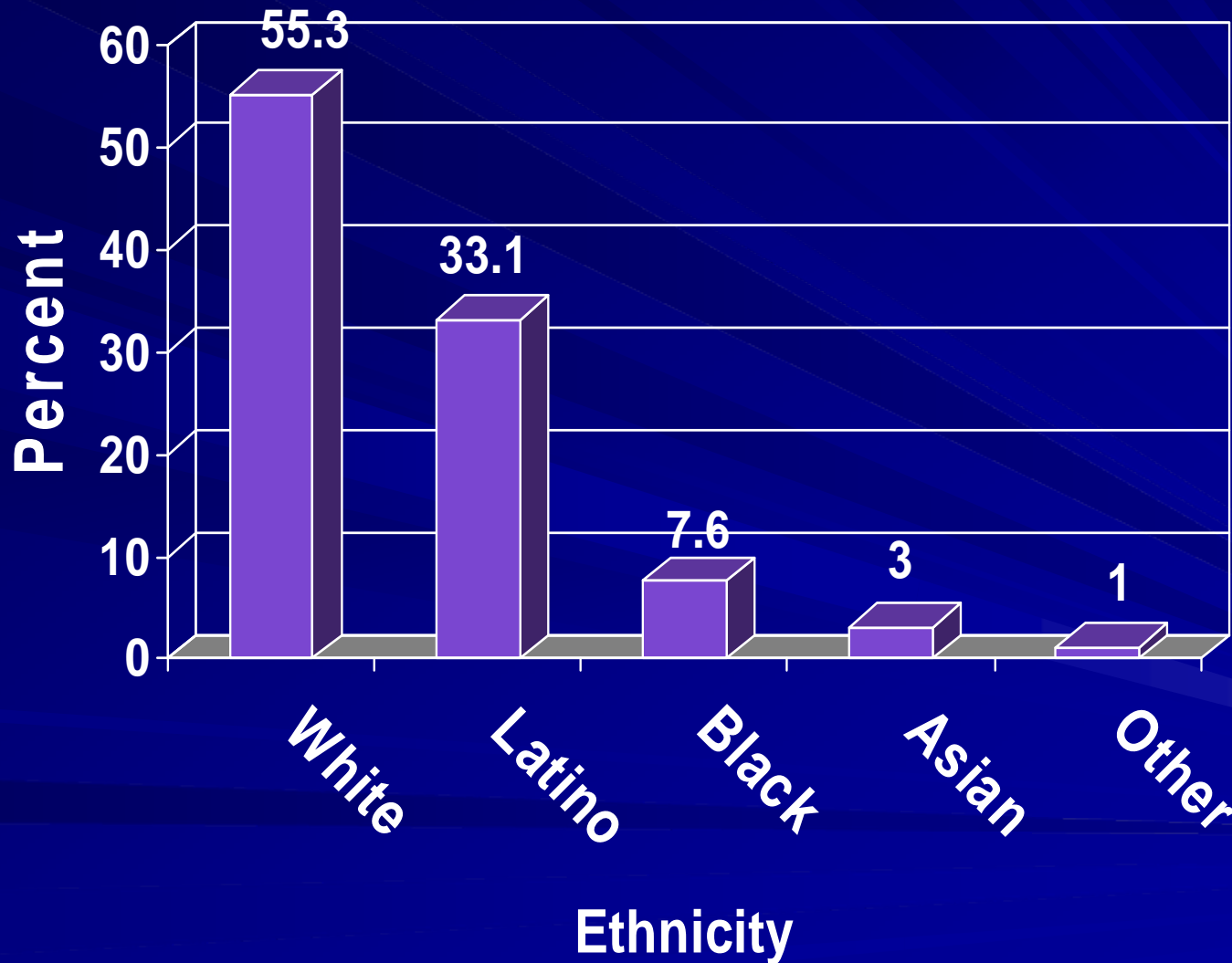
305 Adolescents (13-18 years old)

Average Age ~ 16yrs old (sd=1.138)

Gender: 70.2% Males

Ethnicity: 55.3% White & 33.1% Latino

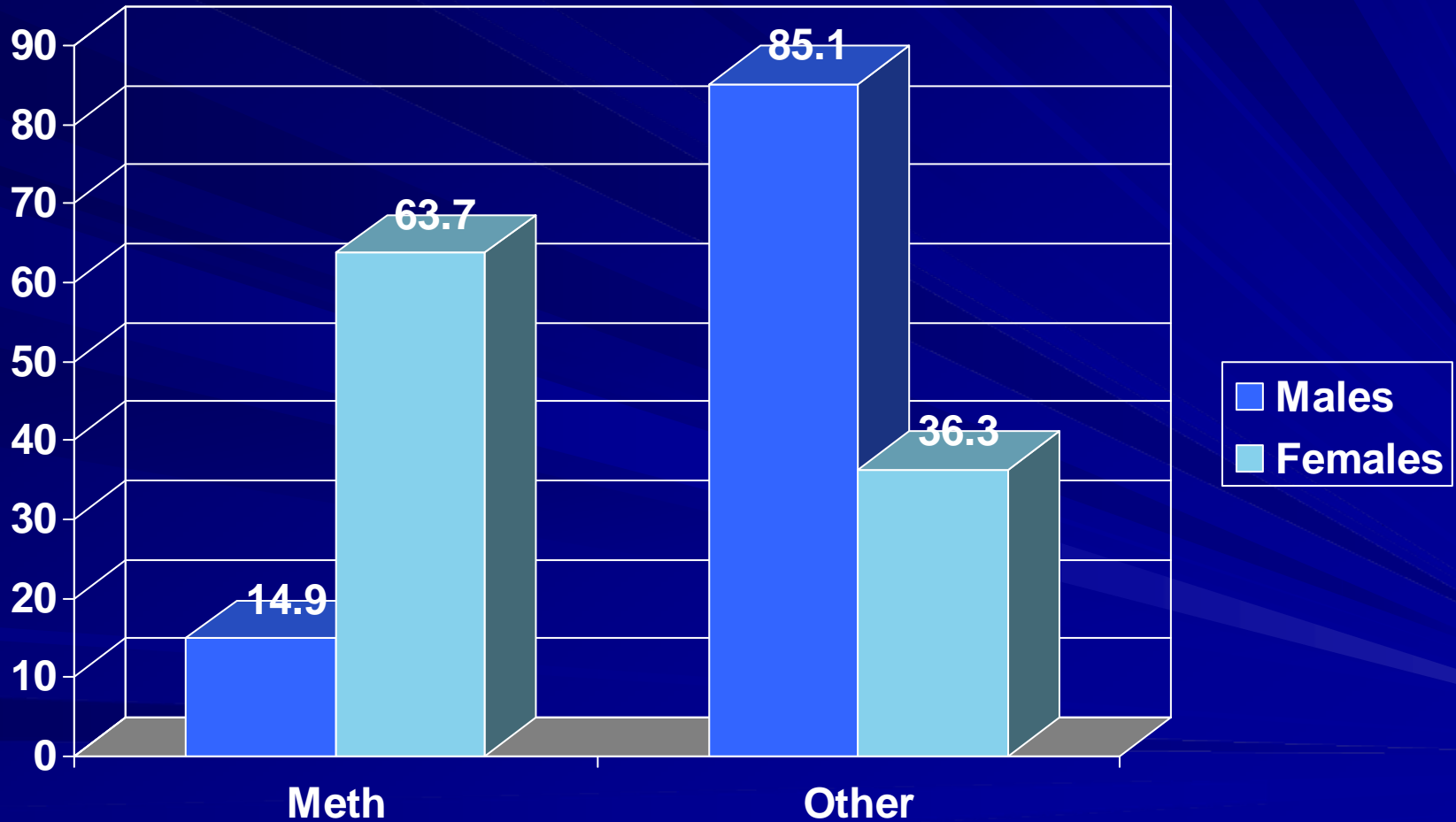
Ethnic Identification



Drug of Choice: N=305

Methamphetamine	74 (24.3%)
Pot	149 (48.9%)
Alcohol	24 (7.9%)
Methamphetamine & Pot	9 (3%)
Methamphetamine & Alcohol	6 (2%)
Pot & Alcohol	26 (8.5%)
Cocaine	6 (2%)
Opiates (Heroin)	3 (1%)
Other	8 (2.6%)

Drug Use by Gender



Treatment History by Drug Use

	% Completed	% Not Completed
Total (N=275*) <i>*30 Missing</i>	139 (50.5%)	136 (49.5%)
METH (n=85)	37 (43.5%)	46 (54.1%)
OTHER (n=190)	102 (53.7%)	88 (46.3%)

Legal Problems

Missing Data*	Total (n=268)	OTHER (n=189)*	METH USERS (n=79)*
Illegal Behaviors			
Arrest Probation Juvenile Hall	177 (66.0%)	124 (65.6%)	53 (67.1%)

Psychological Distress

Missing Data*	<i>Total</i> % Yes (n=275)	<i>OTHER</i> (n=196)	<i>METH</i> <i>USERS</i> (n=79)
Depression*	128 (46.5%)	83 (42.6%)	45 (57.7%)
Suicidality Attempted Suicide Does not want to live Like to injure yourself	72 (26.2%)	48 (24.5%)	24 (30.8%)
Psychopathology* Paranoid Feelings Losing Mind Hearing Voices	87 (31.6%)	53 (27.0%)	34 (43.0%)

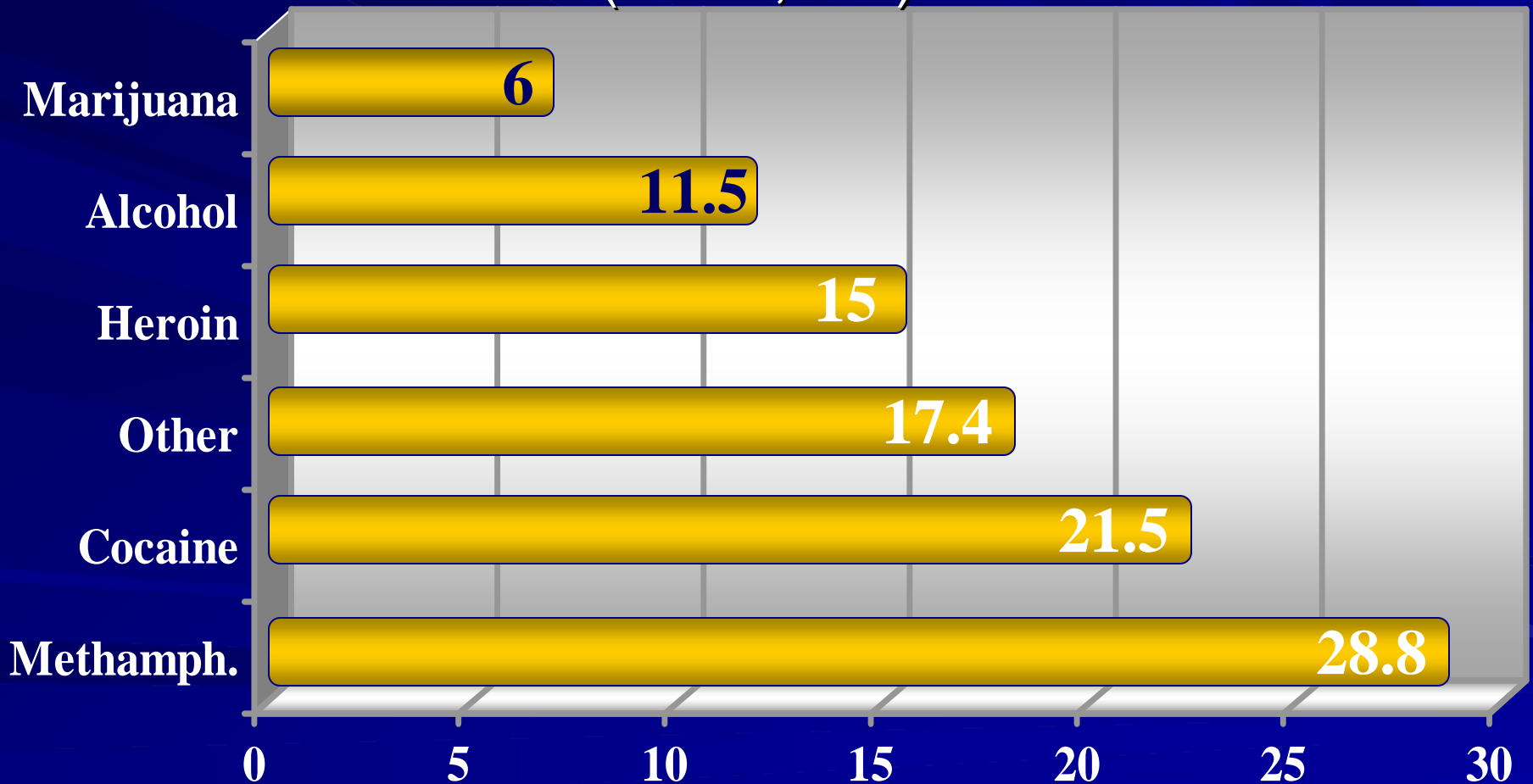
P<.05

Methamphetamine

Incarceration

Primary Substance Reported by California Inmates

(N=22,903)



Methamphetamine Use, Self-Reported Violent Crime, and Recidivism Among Offenders in California Who Abuse Substances *

*

Cartier J, Farabee D, Prendergast M. Methamphetamine Use, Self-Reported Violent Crime, and Recidivism Among Offenders in California Who Abuse Substances. *Journal of Interpersonal Violence*. 2006;21:435-445.

Objective of Study

- Examine the associations between methamphetamine (MA) use and three measures of criminal behavior: (a) self-reported violent criminal behavior, (b) return to prison for a violent offense, and (c) return to prison for any reason.

Methods

■ Participants

– 808 low- to medium-level inmates

- Clear history of substance abuse
- Within 12 months of release
- Half the sample entering an in-prison substance abuse (SA) program and the other half from a neighboring prison that offered no formal SA treatment
- Matched by age, ethnicity, sex offender status, and commitment offense

Methods Continued

- Baseline and 12-Month Follow-Up Interviews
 - Modified versions of criminal justice treatment evaluation forms developed by researchers at Texas Christian University
 - Sections on sociodemographic background, family and peer relations, health and psychological status, criminal involvement, in-depth drug-use history, and an AIDS-risk assessment

Methods Continued

■ Drug Trade Involvement

- Self-report of sales, distribution, or manufacturing of drugs during the 30 days prior to follow-up

■ One-Year Recidivism

- Based on California Department of Corrections records
- General recidivism (return to prison for any reason)
- Violent crime (murder, manslaughter, robbery, assault)

Results

- Those who used MA (81.6%) were significantly more likely than those who did not use MA (53.9%) to have been returned to custody for any reason or to report committing any violent acts in the 30 days prior to follow-up (23.6% vs. 6.8%, respectively)

Results Continued

- After controlling for drug trade involvement, MA use was still significantly predictive of self-reported violent crime and general recidivism

Implications of Results

- These findings suggest that offenders who use MA may differ significantly from their peers who do not use MA and may require more intensive treatment interventions and parole supervision than other types of offenders who use drugs

Possible Limitations

- Self-Reports
 - But evidence exists that the concordance of self-report with actual crime committed is quite high
- Absence of Arrest Records
 - Reliance on records that contain only the offense for which the parolee was convicted, or pled guilty to, not the full array of charges cited at arrest
- Drop-Out
 - Lost 19% of the original cohort to follow-up
 - But no significant differences between this subgroup and the larger group in basic demographic variables and recidivism rates