

Methamphetamine: What Research Says About Treatment

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Methamphetamine Treatment



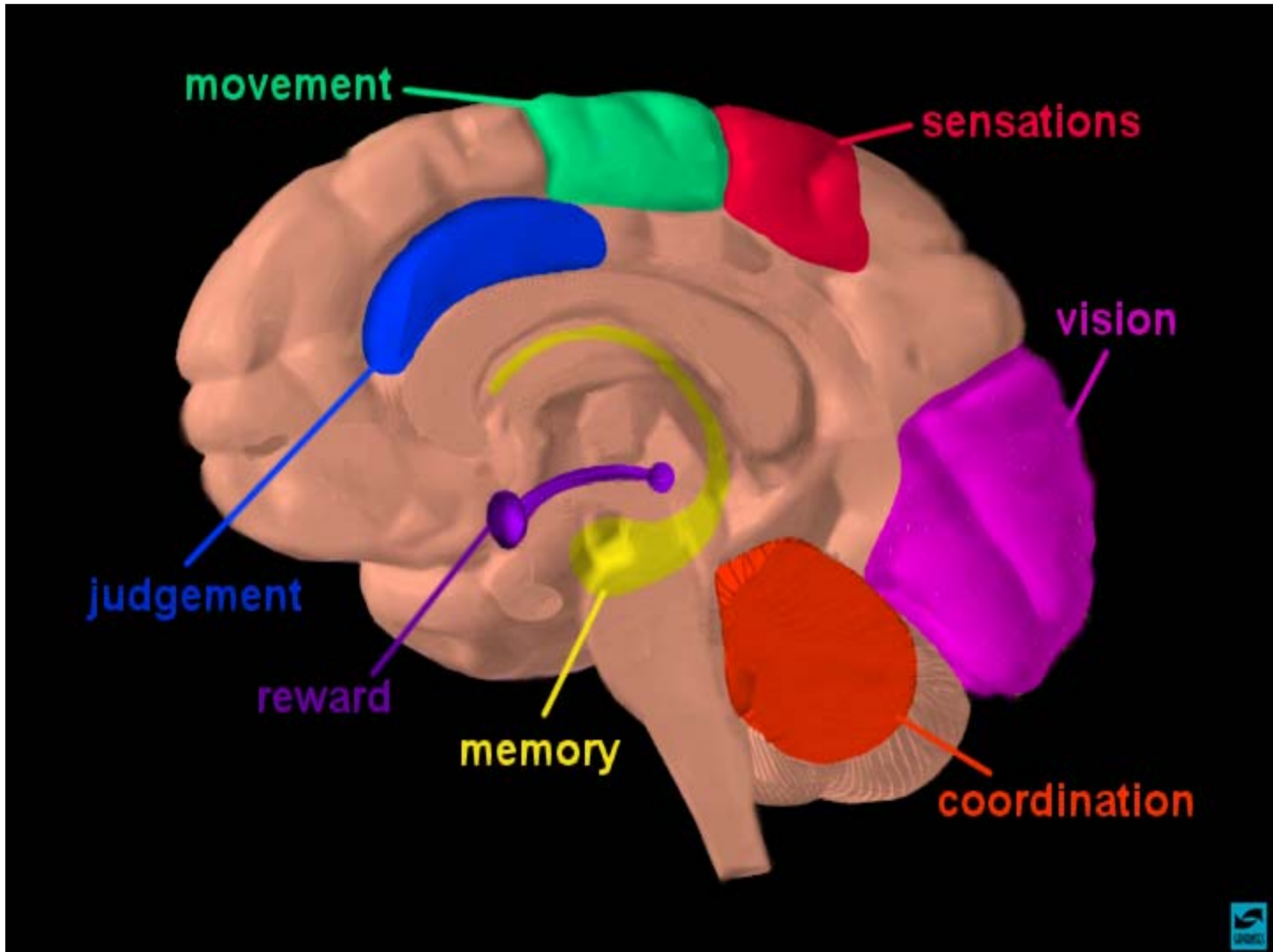
Limitations on Current Treatments

- 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.

**What does the research
indicate about treatment?**



First, let's look at
the brain



movement

sensations

vision

judgement

reward

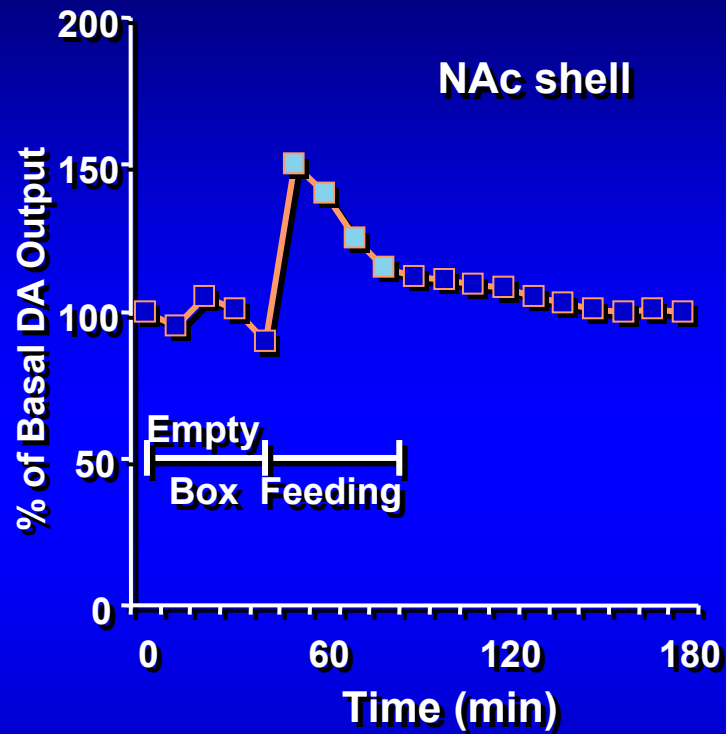
memory

coordination



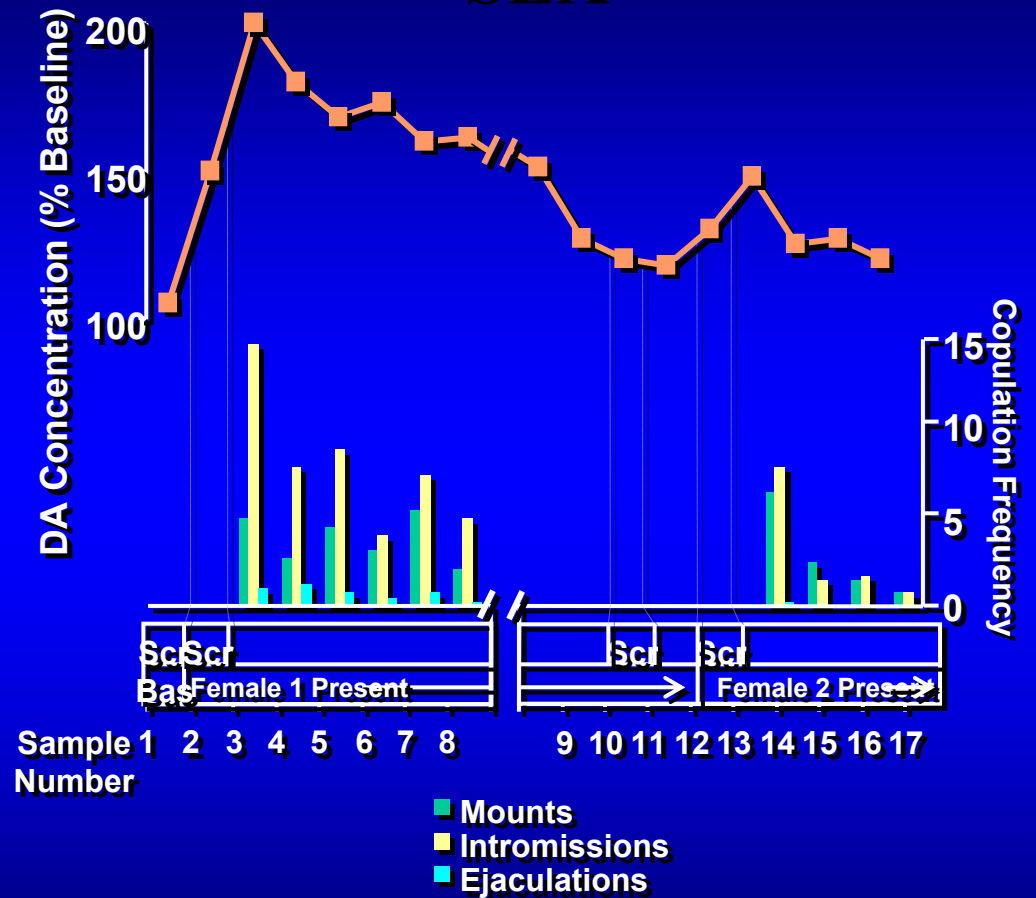
Natural Rewards Elevate Dopamine Levels

FOOD



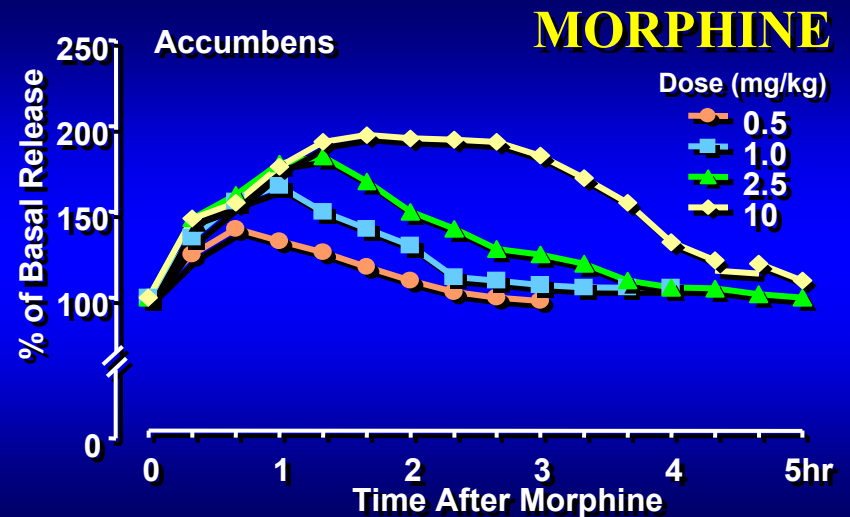
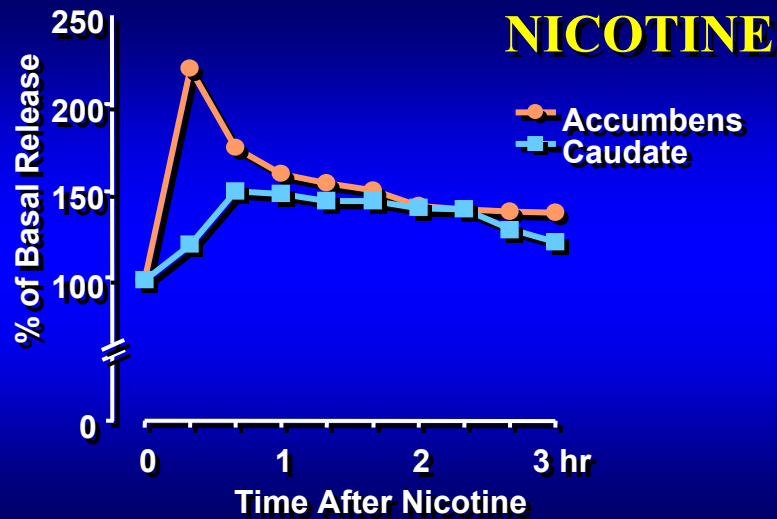
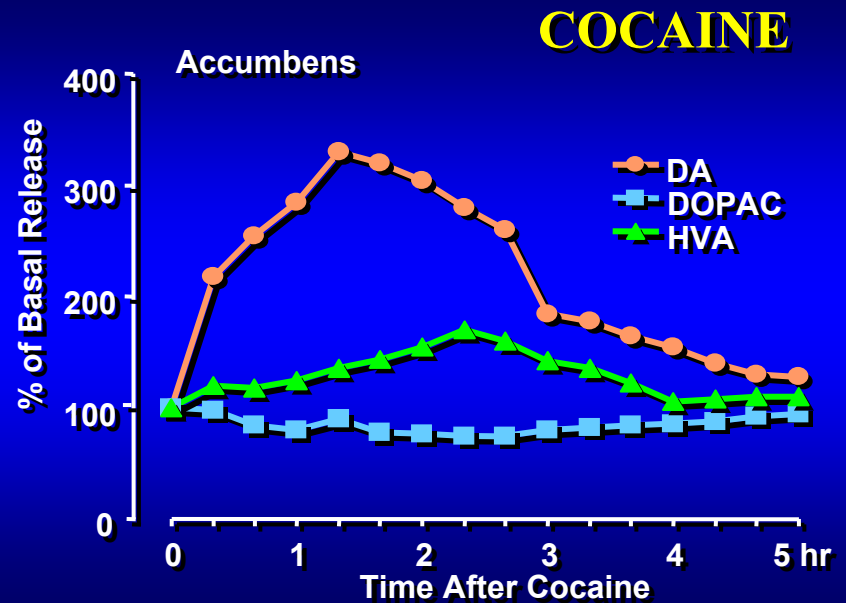
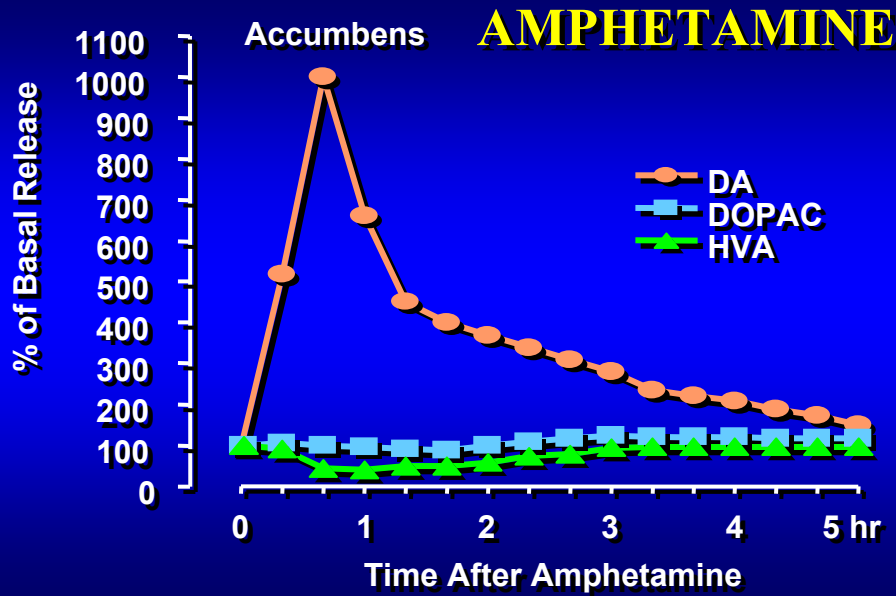
Source: Di Chiara et al.

SEX



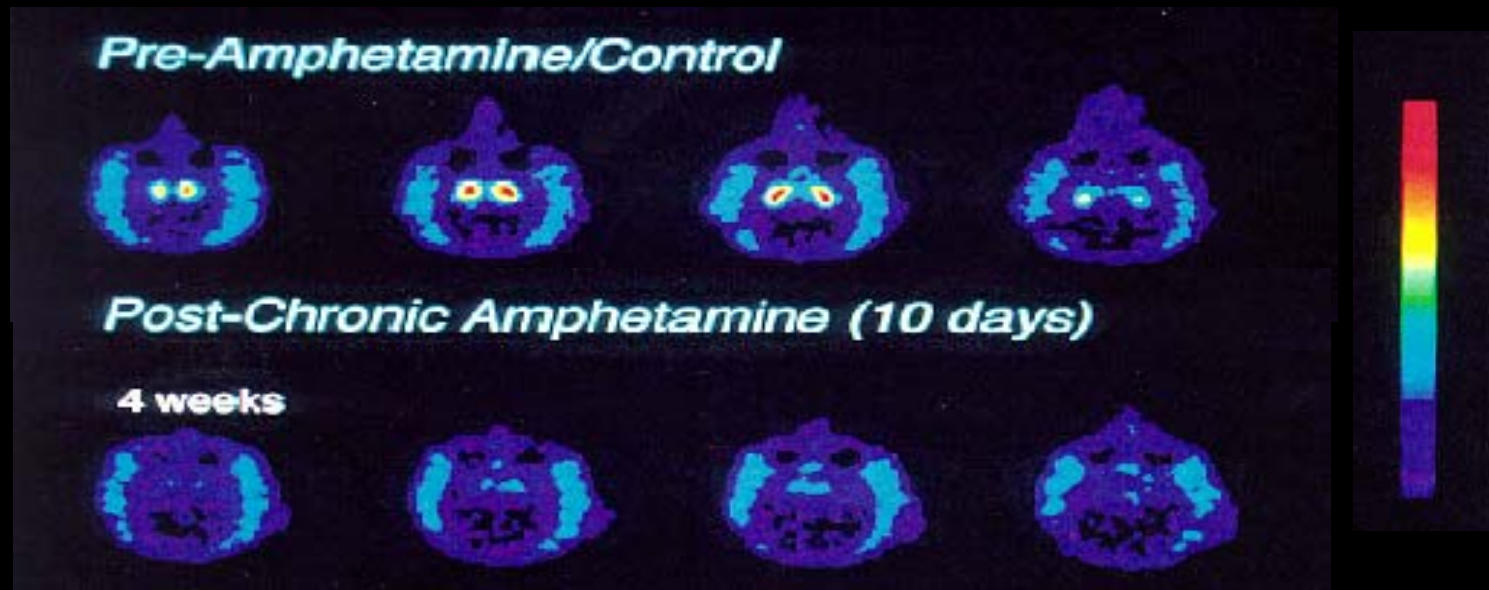
Source: Fiorino and Phillips

Effects of Drugs on Dopamine Levels



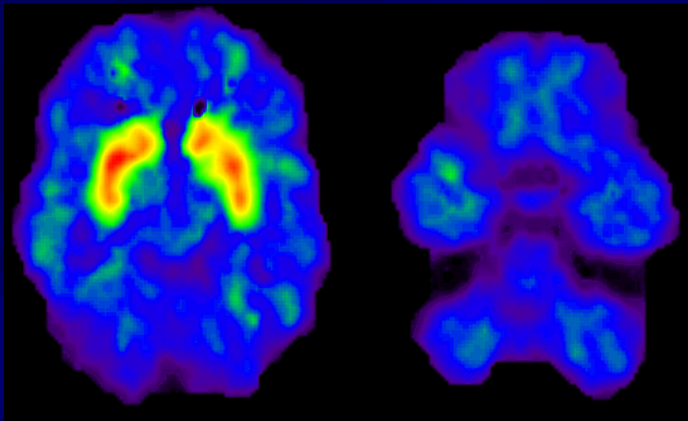
Source: Di Chiara and Imperato

PET Scan of Long-Term Impact of Methamphetamine on the Brain

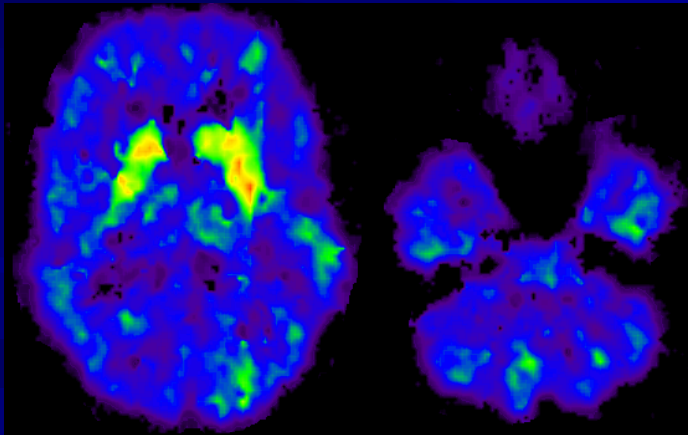


Superior  Inferior

Dopamine Transporters in Methamphetamine Abusers

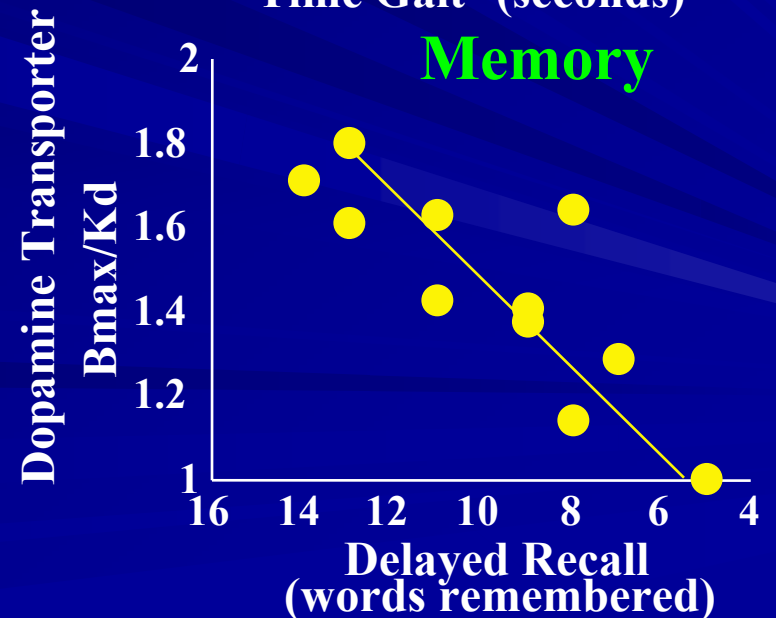
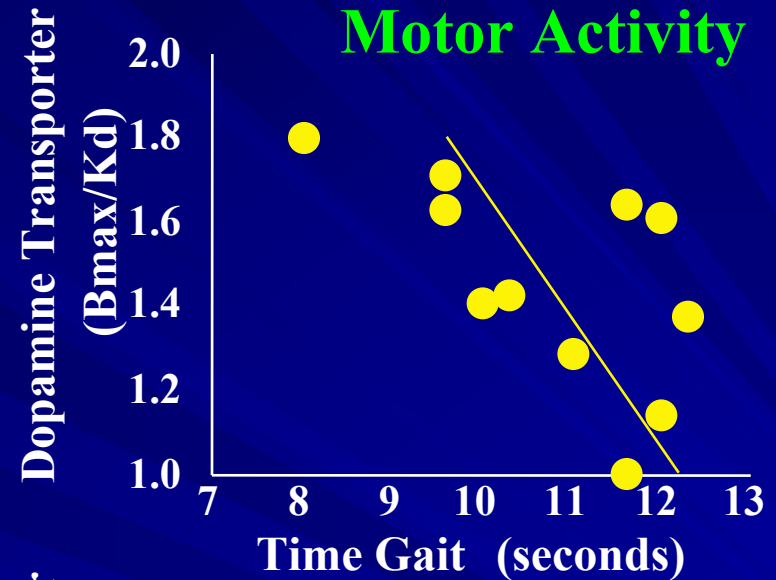


Normal Control

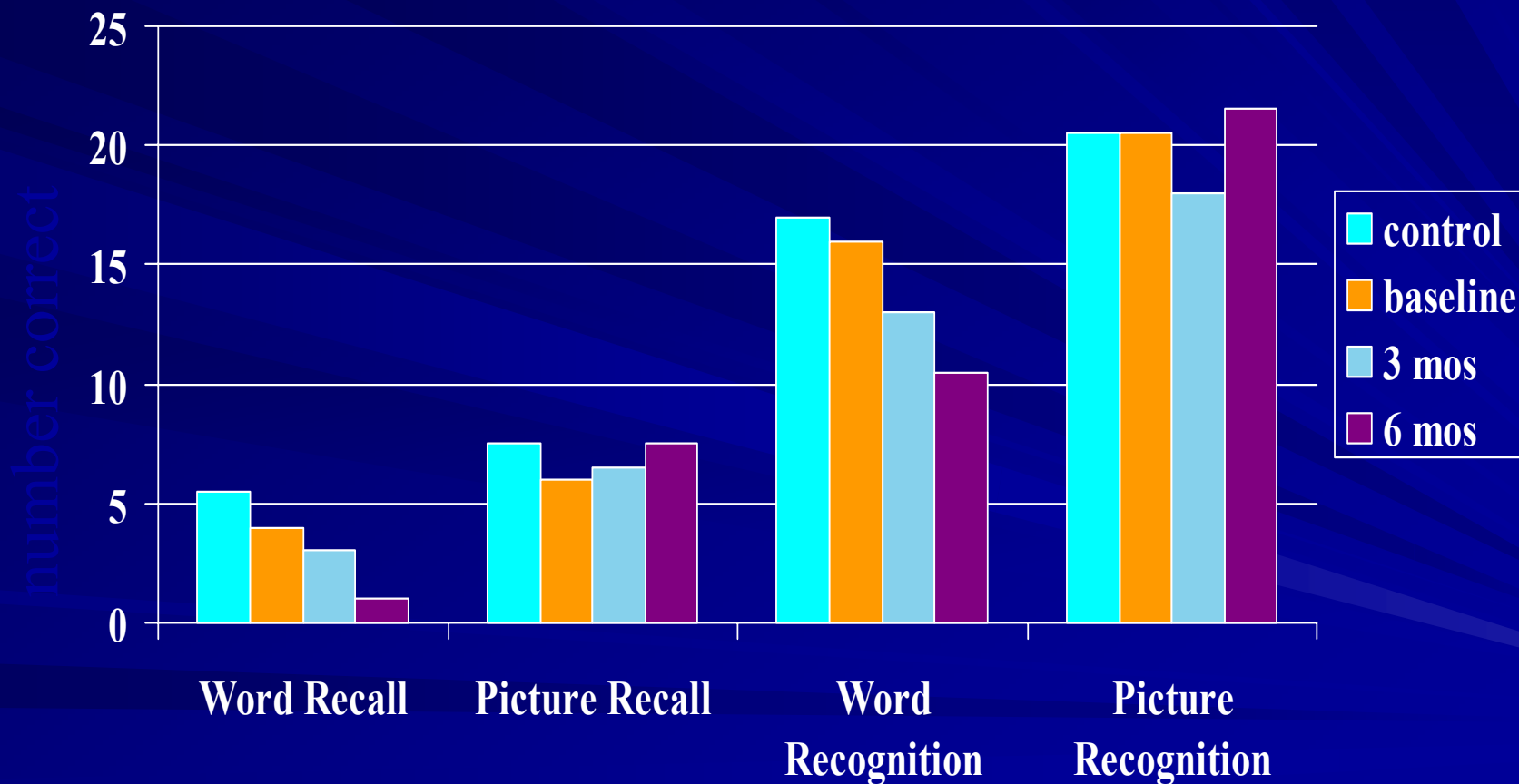


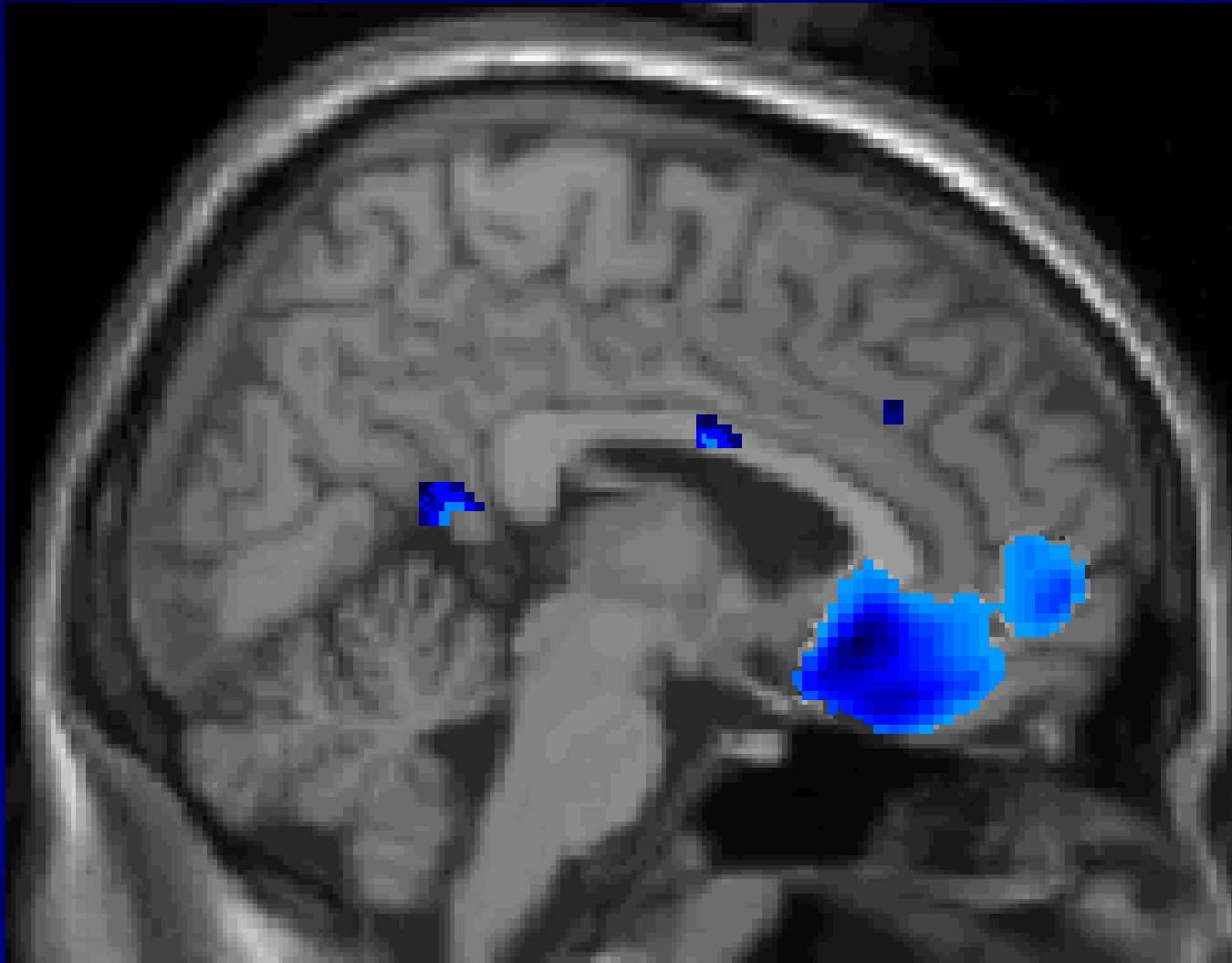
Methamphetamine Abuser

$p < 0.0002$



Longitudinal Memory Performance

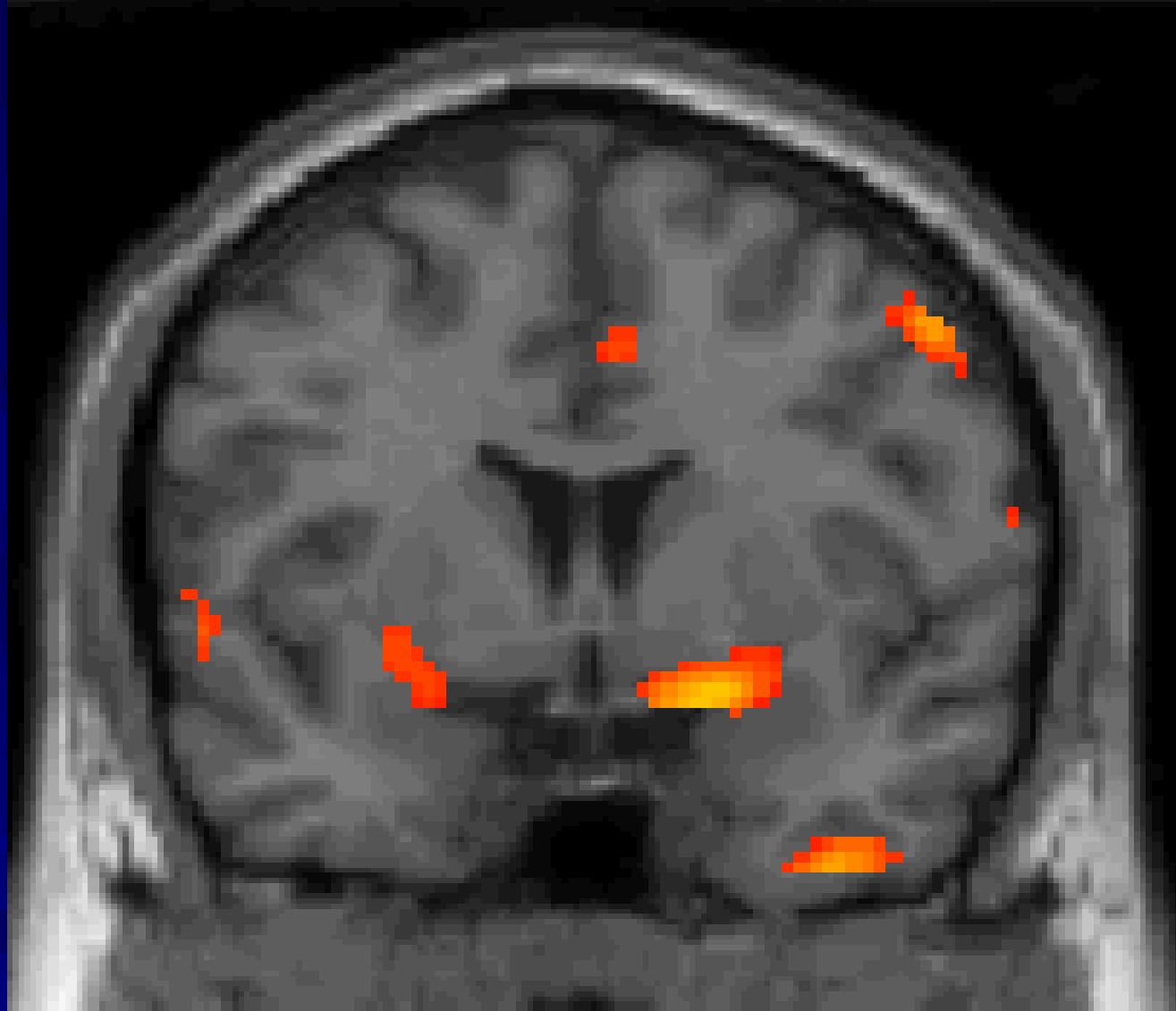




Control
> MA



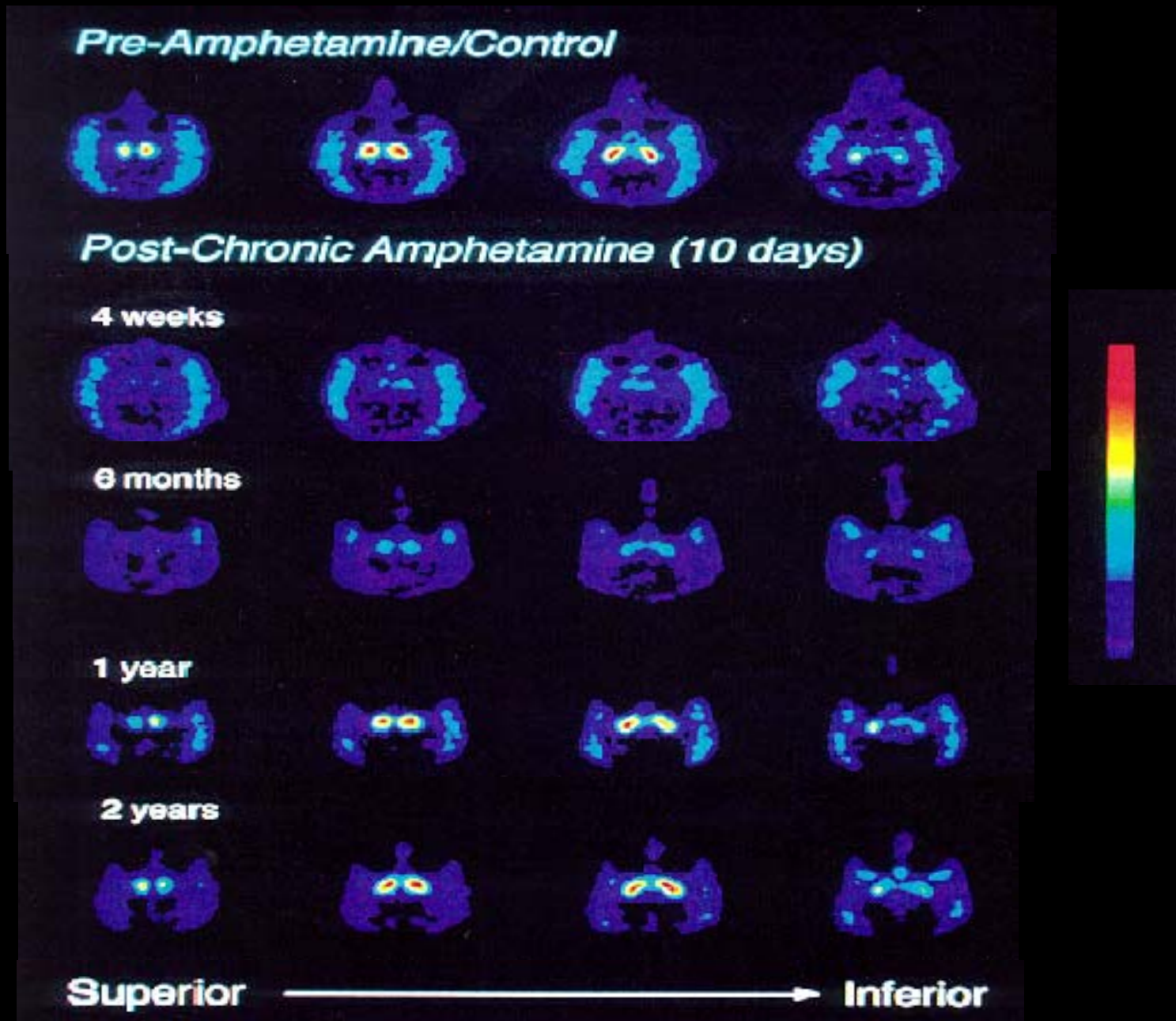
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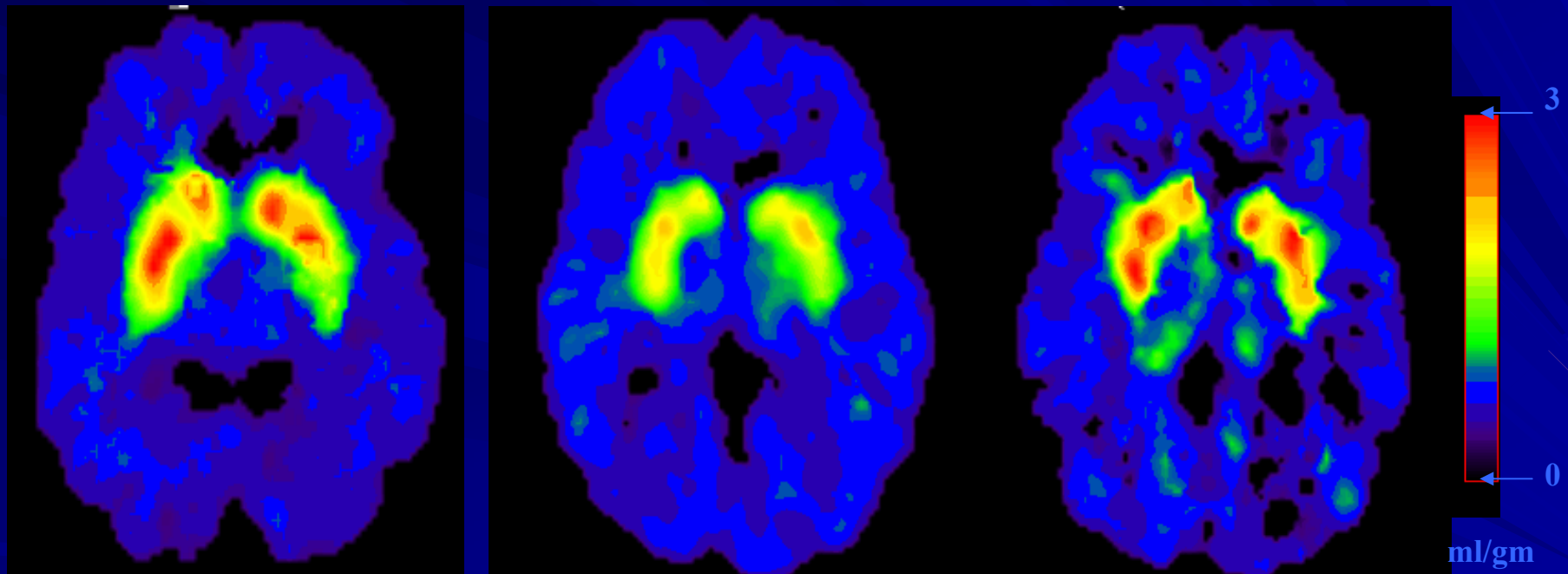
MA >
Control



PET Scan of Long-Term Meth Brain Damage



Partial Recovery of Brain Dopamine Transporters in Methamphetamine (METH) Abuser After Protracted Abstinence



Normal Control

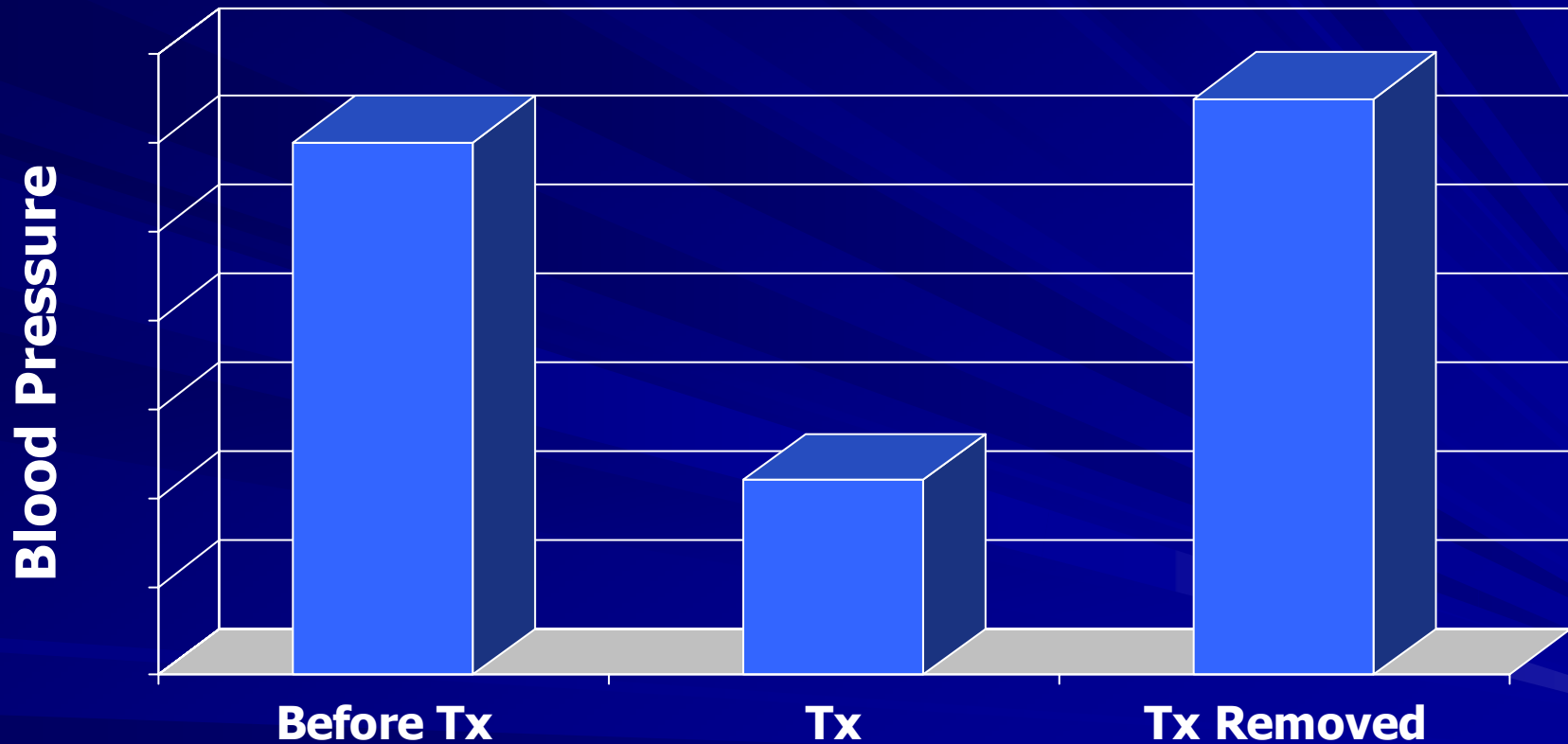
METH Abuser
(1 month detox)

METH Abuser
(24 months detox)

Source: Volkow, ND et al., *Journal of Neuroscience* 21, 9414-9418, 2001.

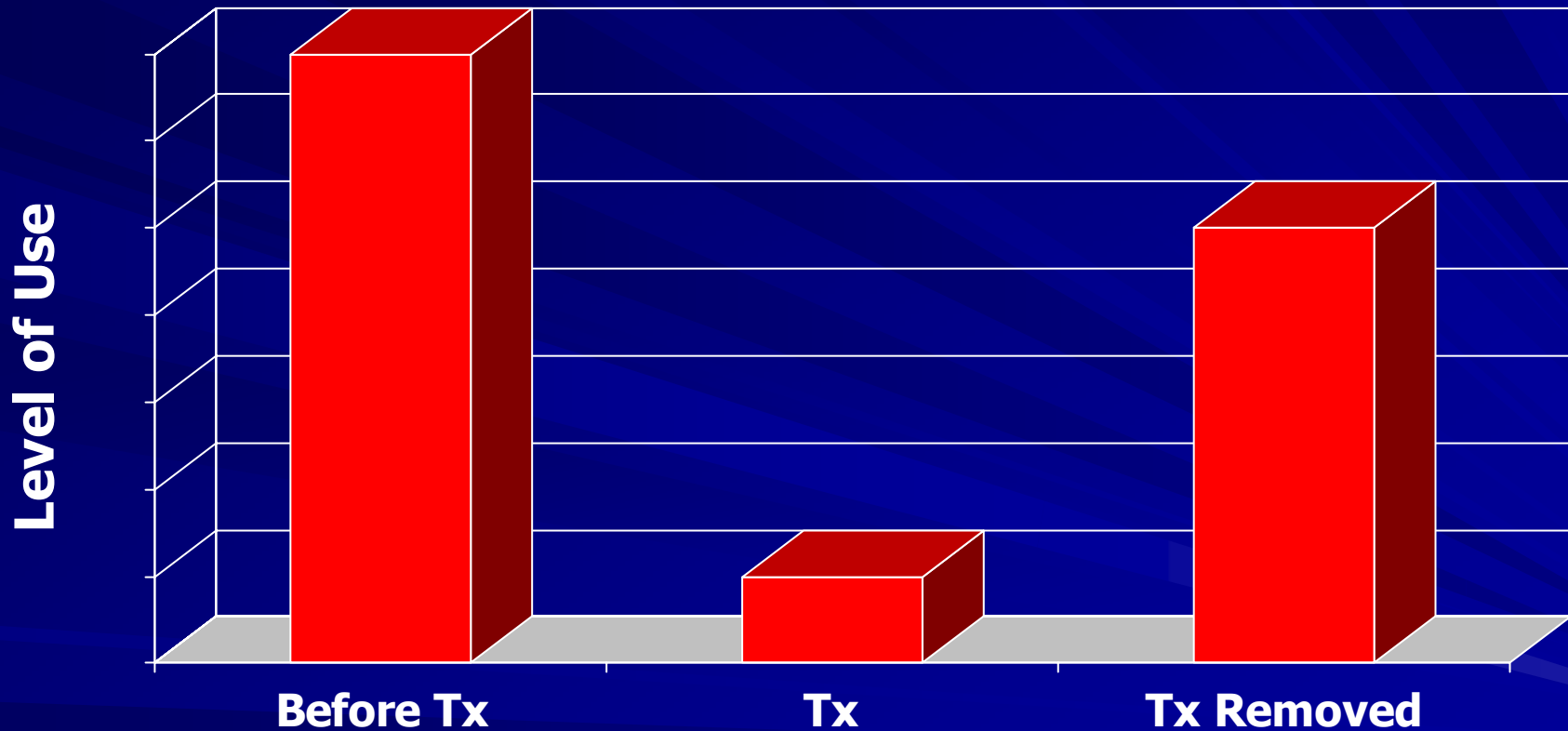
**What does the research
indicate about treatment?**

Investigational Medication for High Blood Pressure



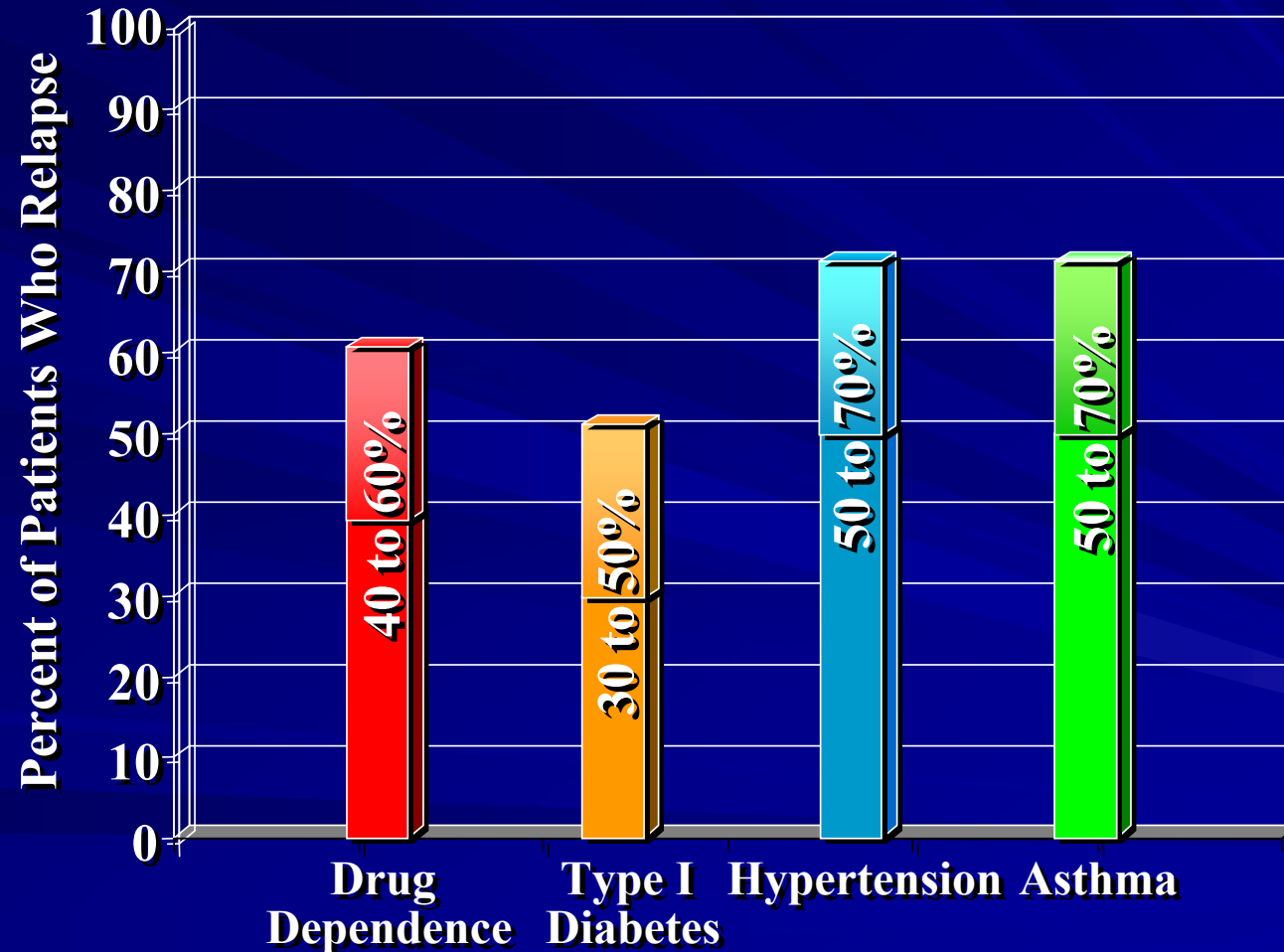
Treatment Works!!!

New Behavioral Treatment for Methamphetamine Use



Treatment Failed!!!

Relapse Rates Are Similar for Drug Dependence and Other Chronic Illnesses



Source: McLellan, A.T. et al., JAMA, Vol 284(13), October 4, 2000.

**What treatments have
empirical support?**

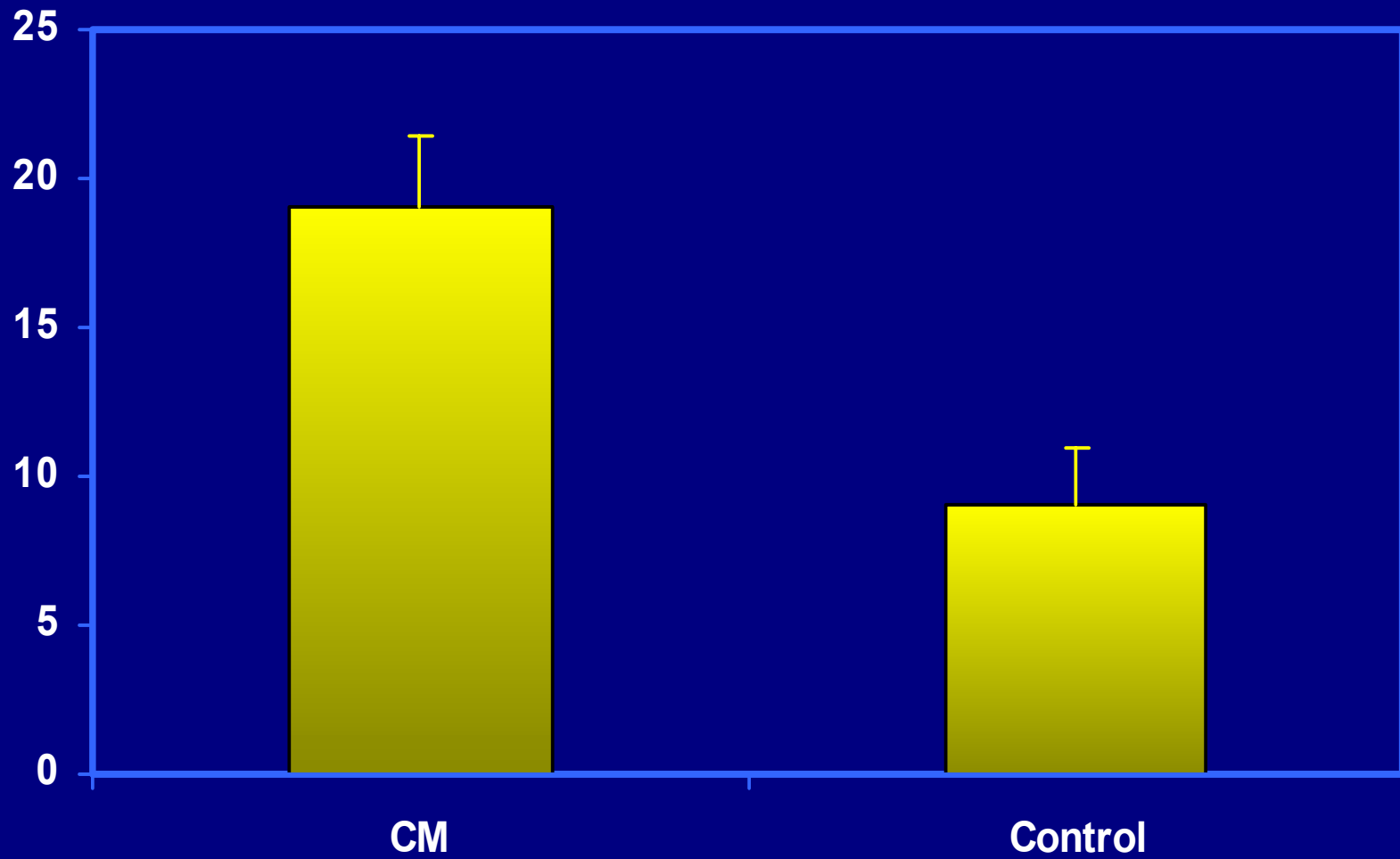
Contingency Management

- 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.

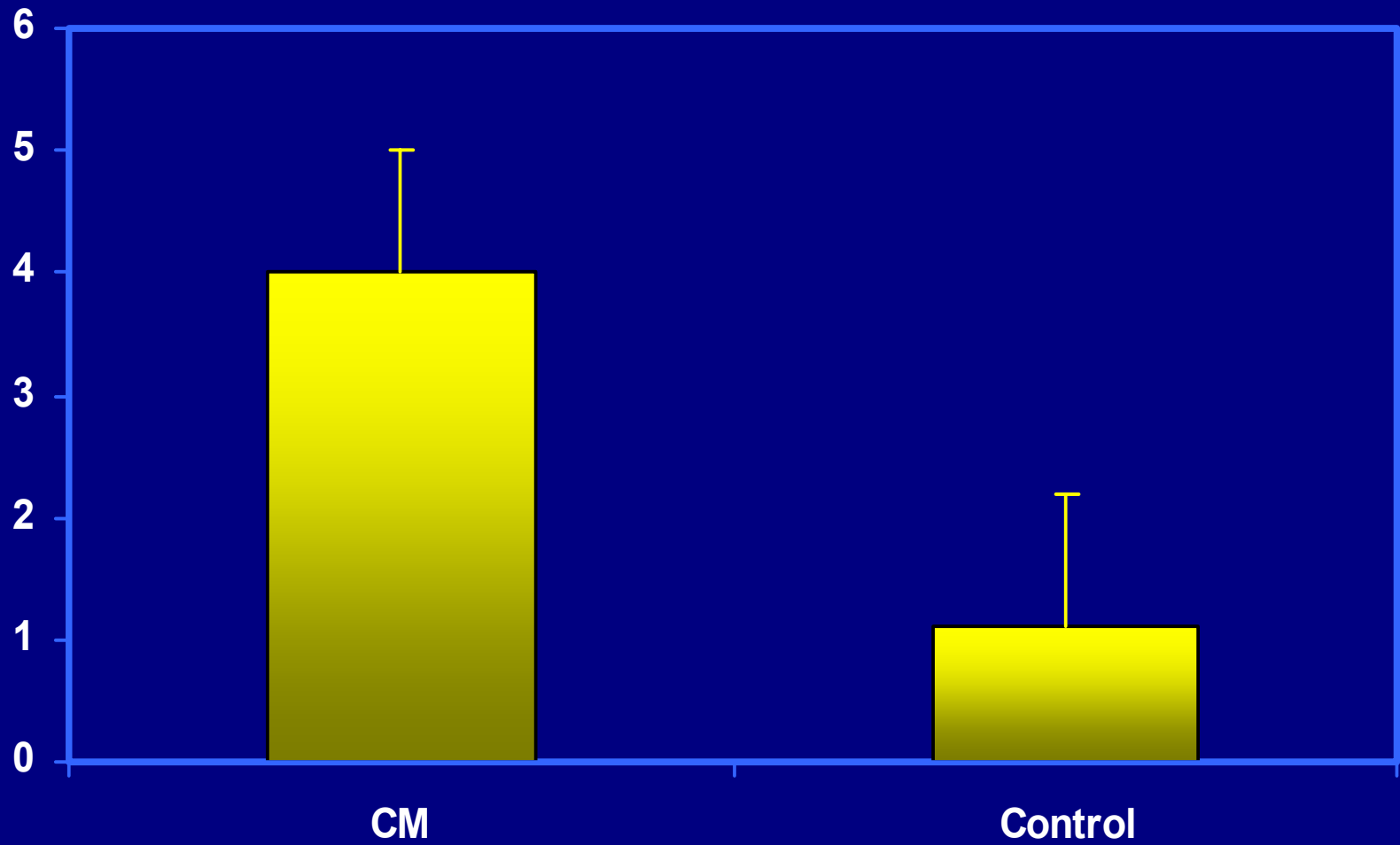
Contingency Management for treatment of methamphetamine dependence

- 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**
 - 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.

Mean number of abstinences



Mean weeks of consecutive abstinence



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

- Design: RTC
- Intervention: 2 session vs 4 session CBT
- Findings There was a **significant increase in the likelihood of abstinence** from amphetamines among those receiving two or more treatment sessions.
 - 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 for both groups.
 - Reduction in amphetamine use was accompanied by **significant improvements** in stage of change, benzodiazepine use, tobacco smoking, polydrug use, injecting risk-taking behavior, criminal activity level, and psychiatric distress and depression level.

Cognitive Behavioral Therapy & 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.
- Results CM procedures produced better retention and lower rates of stimulant use during the study period.
 - 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.

Cognitive Behavioral Therapy & Contingency Management for Stimulant Dependence (cont'd)

■ Conclusions:

- CM is an efficacious treatment for **reducing stimulant use**
- CM 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.

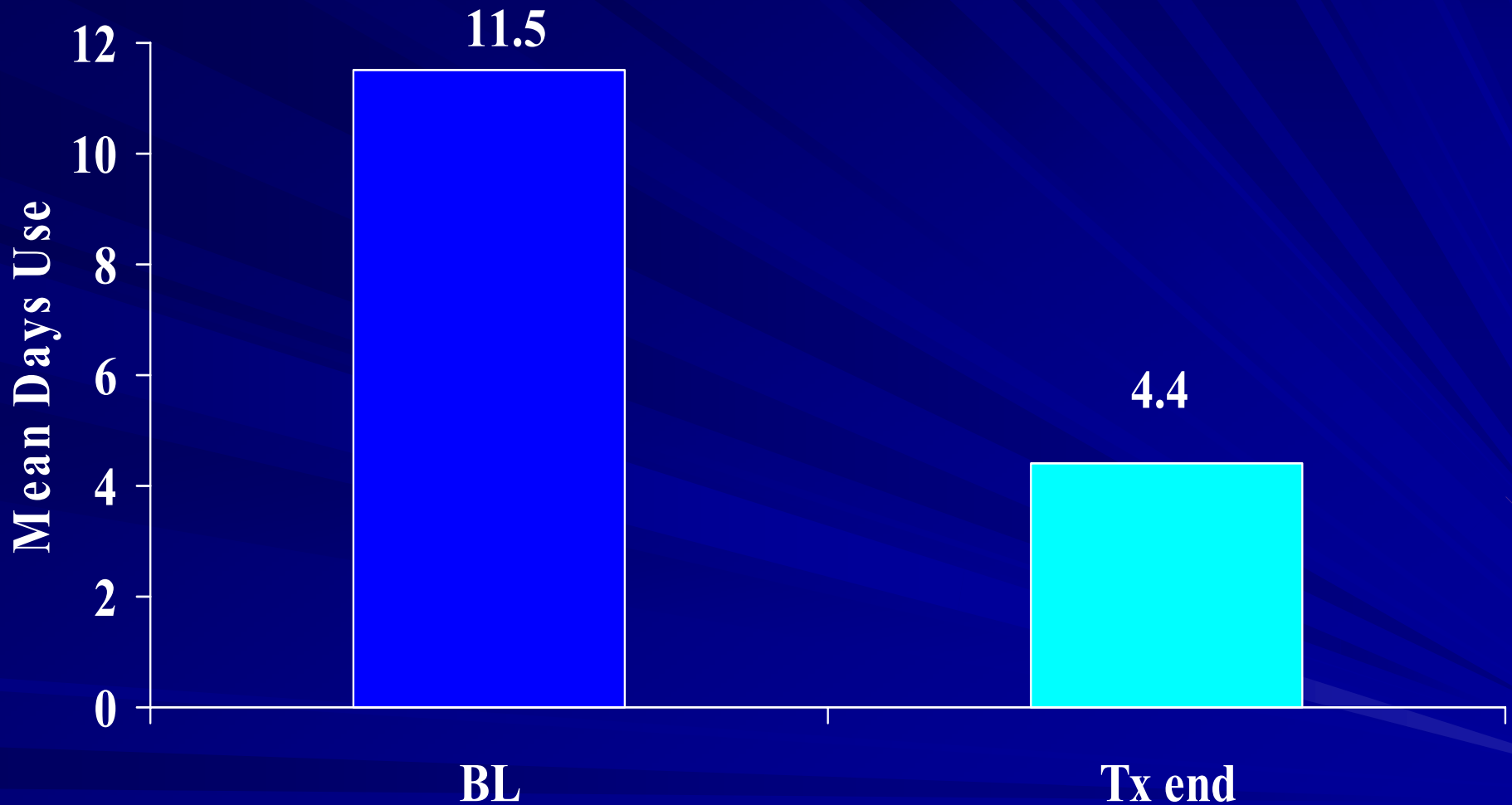
Matrix Model

- 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

Matrix Model in Treatment of Methamphetamine Dependence

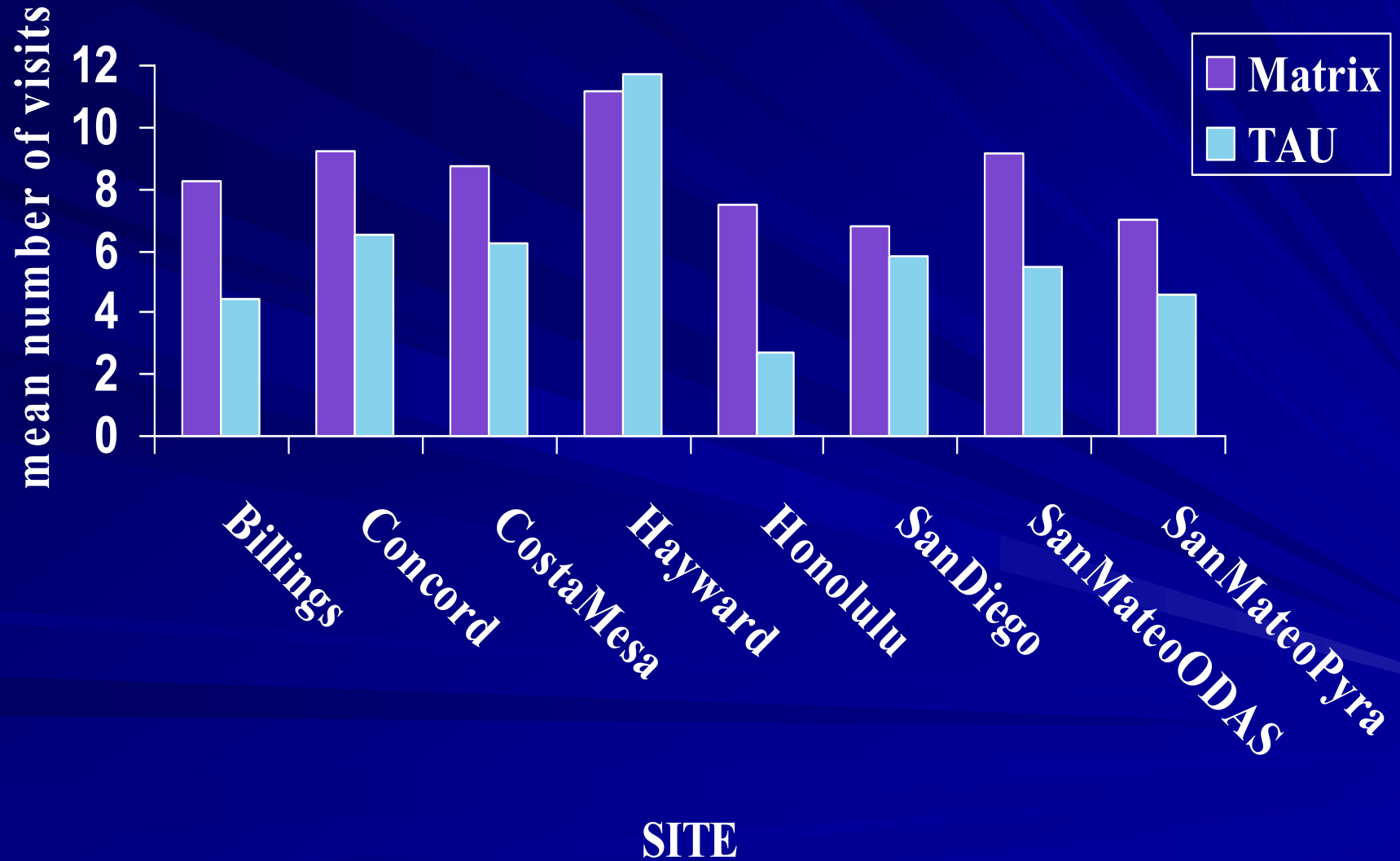
- ***Design:*** Randomized clinical trial.
- **Method:** 978 treatment-seeking, MA-dependent persons were randomly assigned to receive either TAU at each site, or a manualized 16-week treatment (Matrix Model) for their MA dependence.

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



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?

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



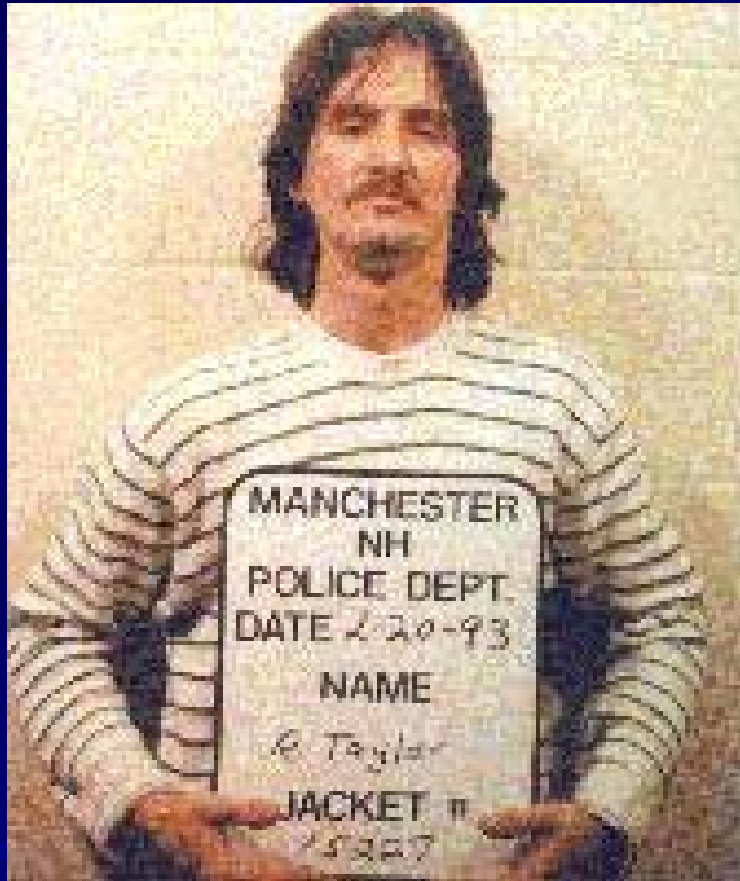




1998

Anorexia/Severe Weight Loss

Anorexia/Severe Weight Loss



2-20-93

7-03-94



2-08-94

Dental Problems

- Methamphetamine-related tooth decay, often called “meth mouth,” may be caused by:
 - The **acidic** nature of the drug
 - The drug’s ability to **dry the mouth**, reducing the amount of protective saliva around the teeth
 - Drug-induced cravings for **sugary carbonated beverages**
 - The tendency of users to **grind and clench** their teeth
 - The long duration of the drug’s effects (12 hours), which leads to long periods when users are **not likely to clean their teeth**

METH Use Leads to Severe Tooth Decay



“Meth Mouth”

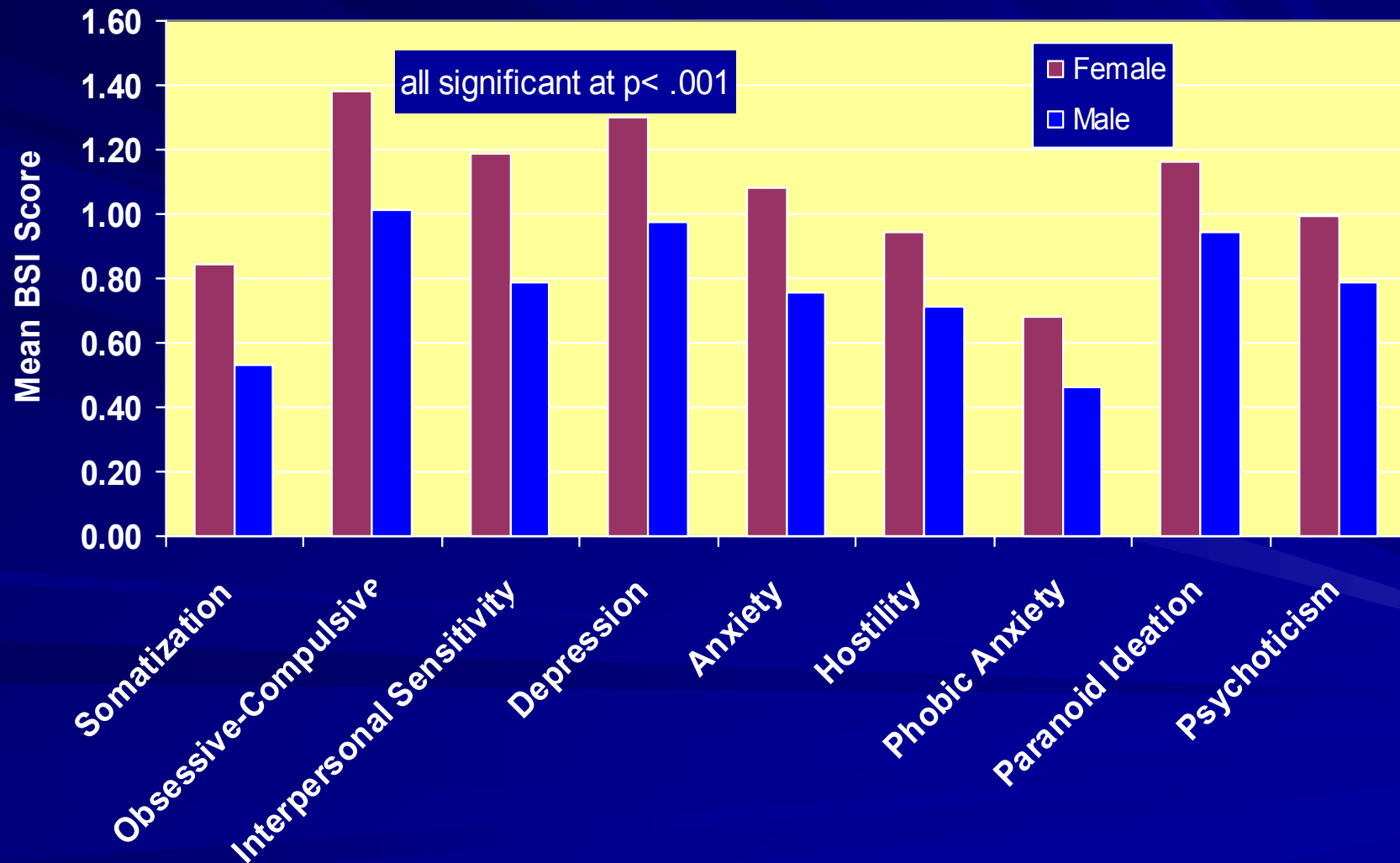
Source: *The New York Times*, June 11, 2005.

Gender Differences

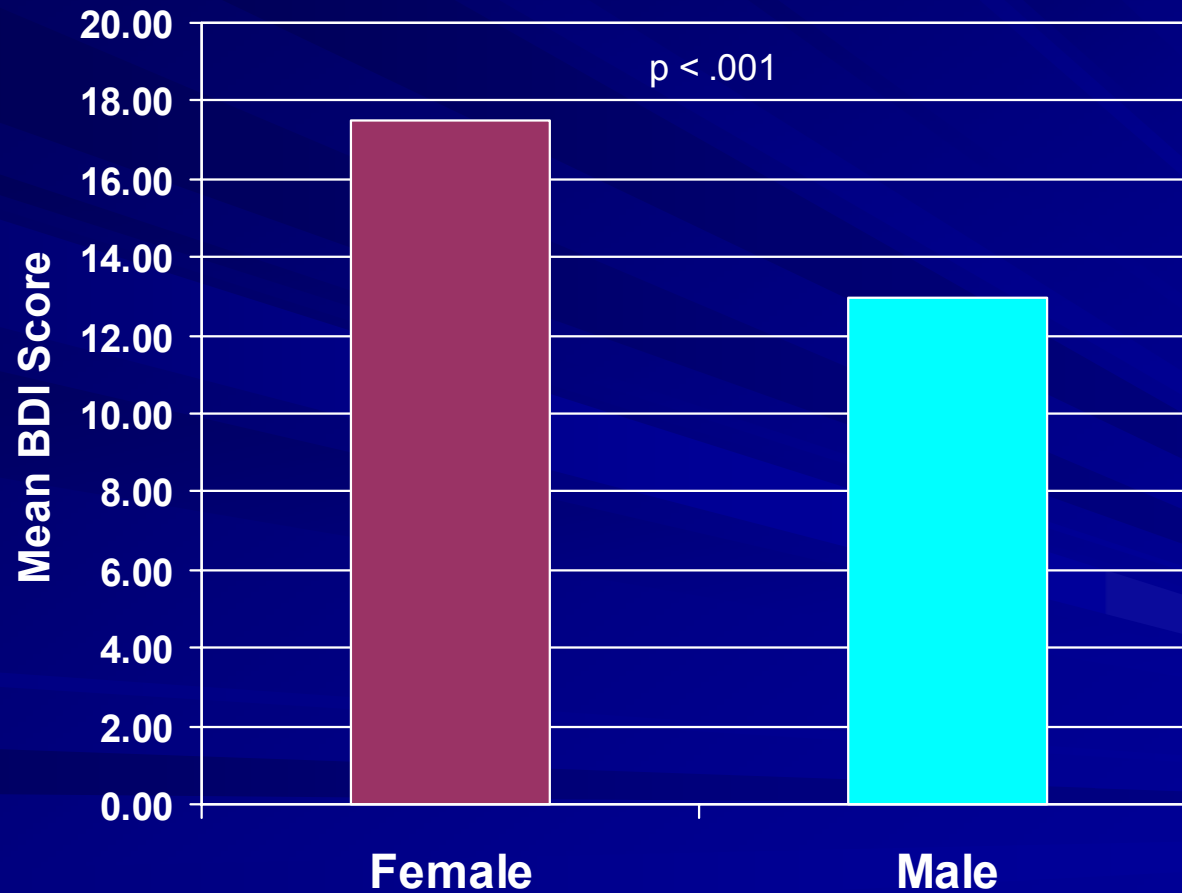
Women's Issues

Craving

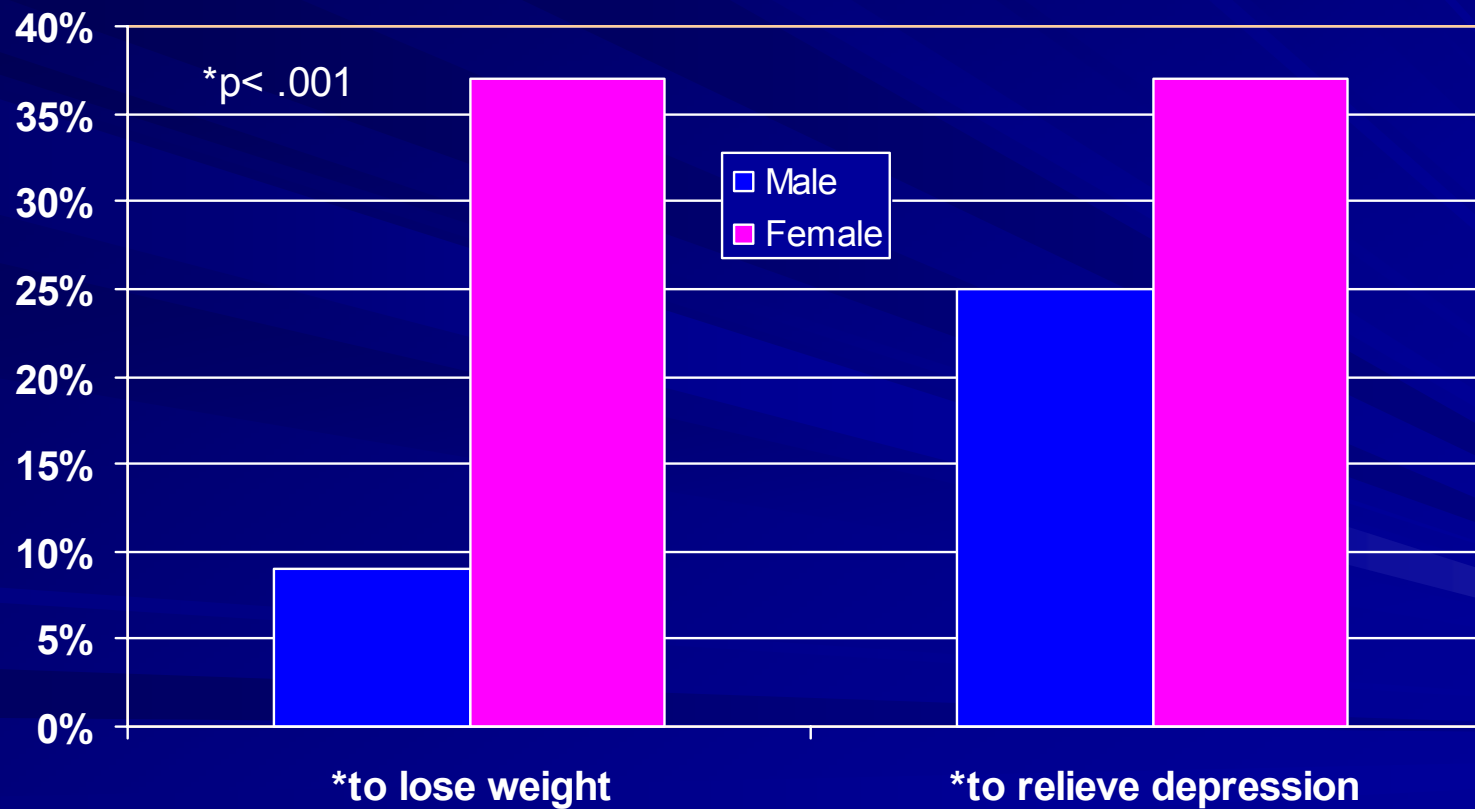
Behavior Symptom Inventory (BSI) Scores at Baseline



Beck Depression Inventory (BDI) Scores at Baseline

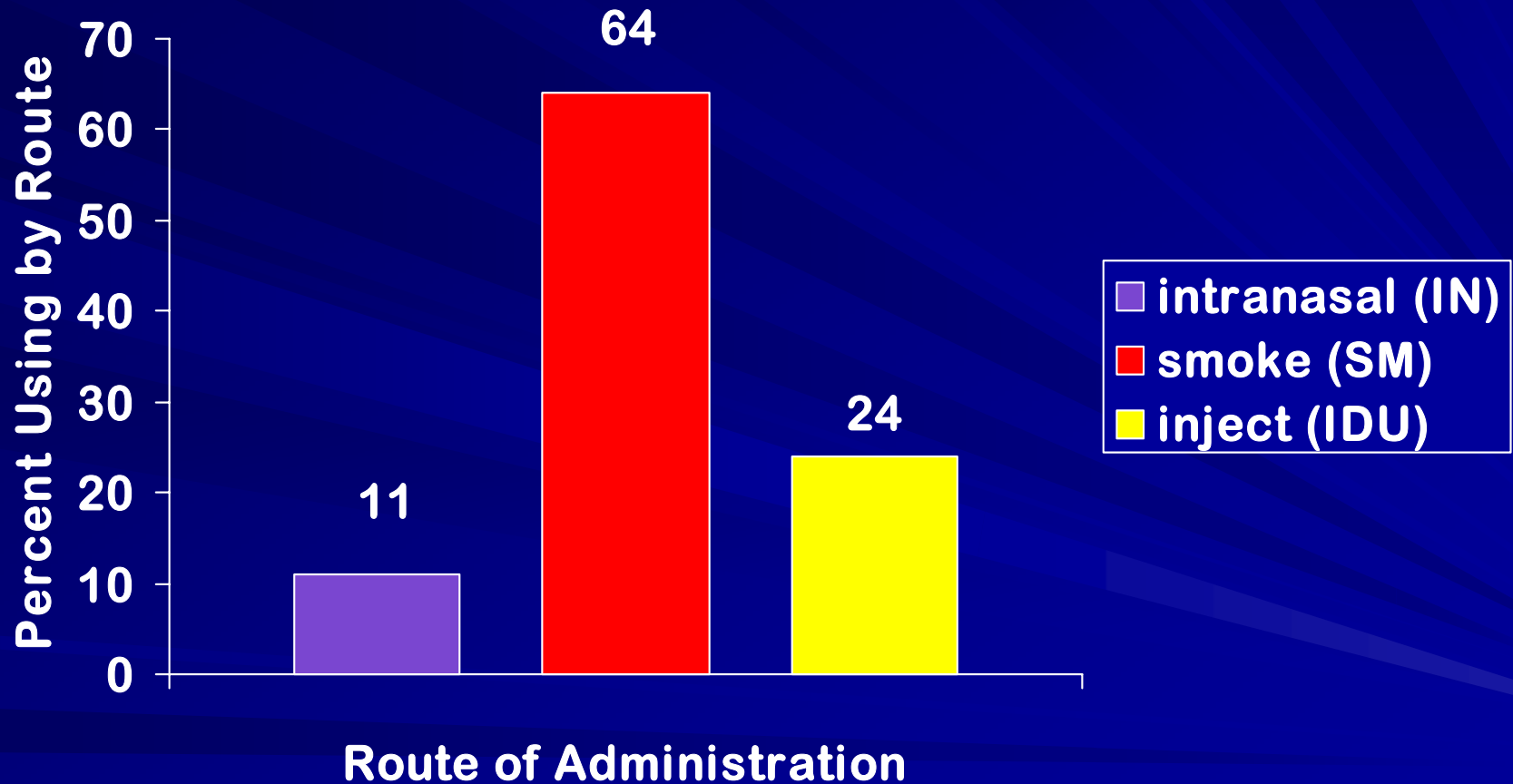


Self-Reported Reasons for Starting Methamphetamine Use

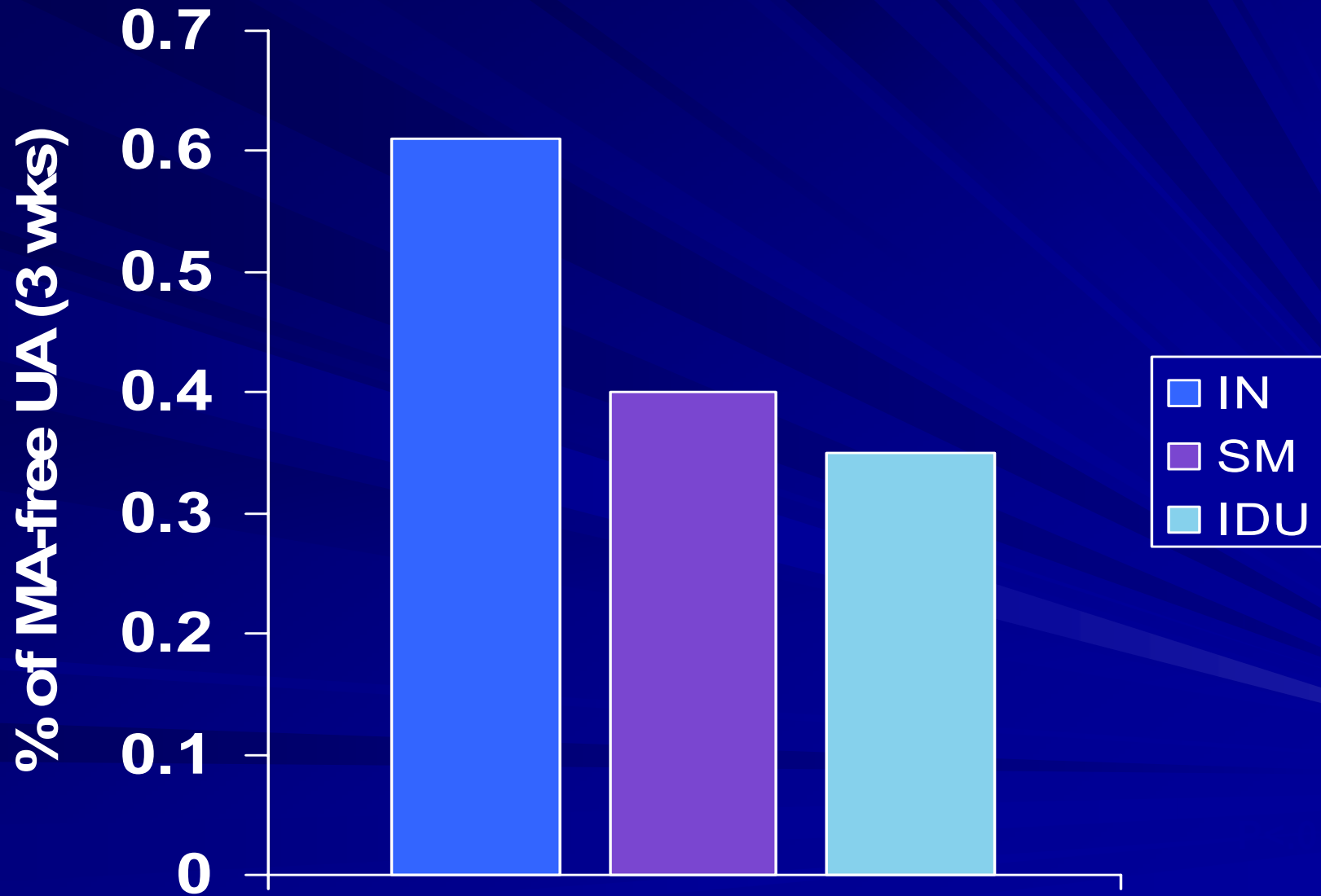


Route of Administration

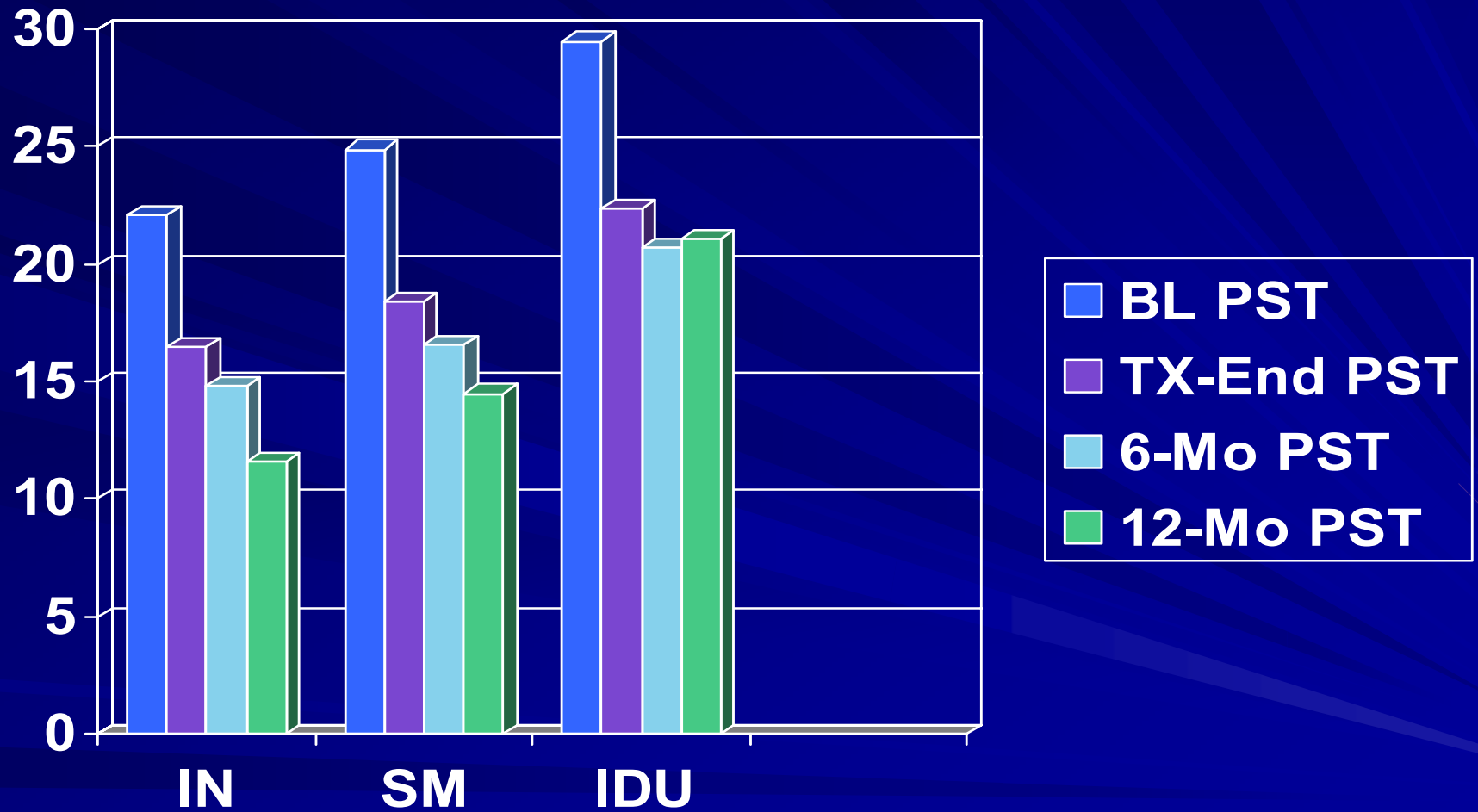
Route of Methamphetamine Administration



MA-Free Samples by Route



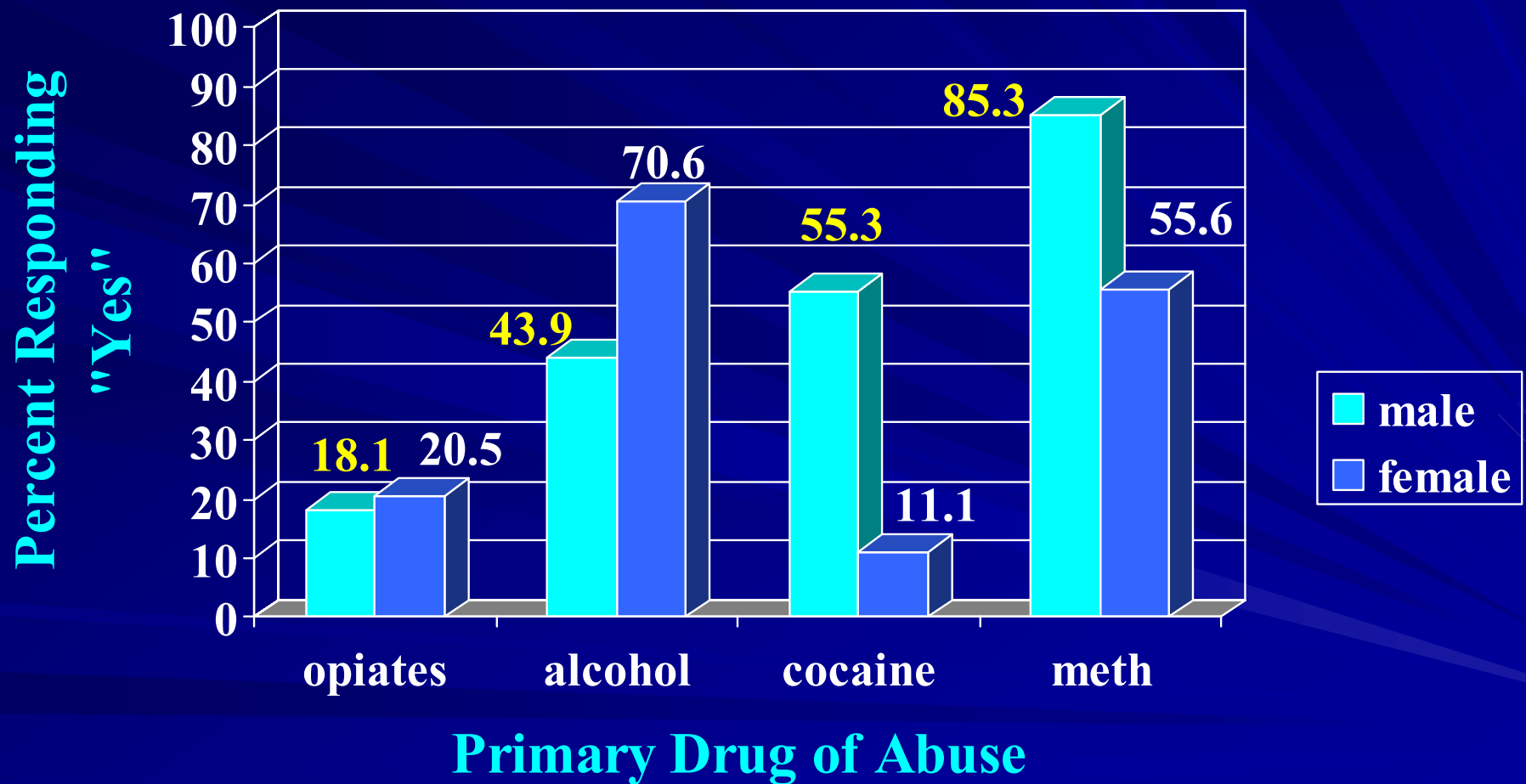
BSI Psychiatric Symptoms by Route



Positive Symptom Total (PST)

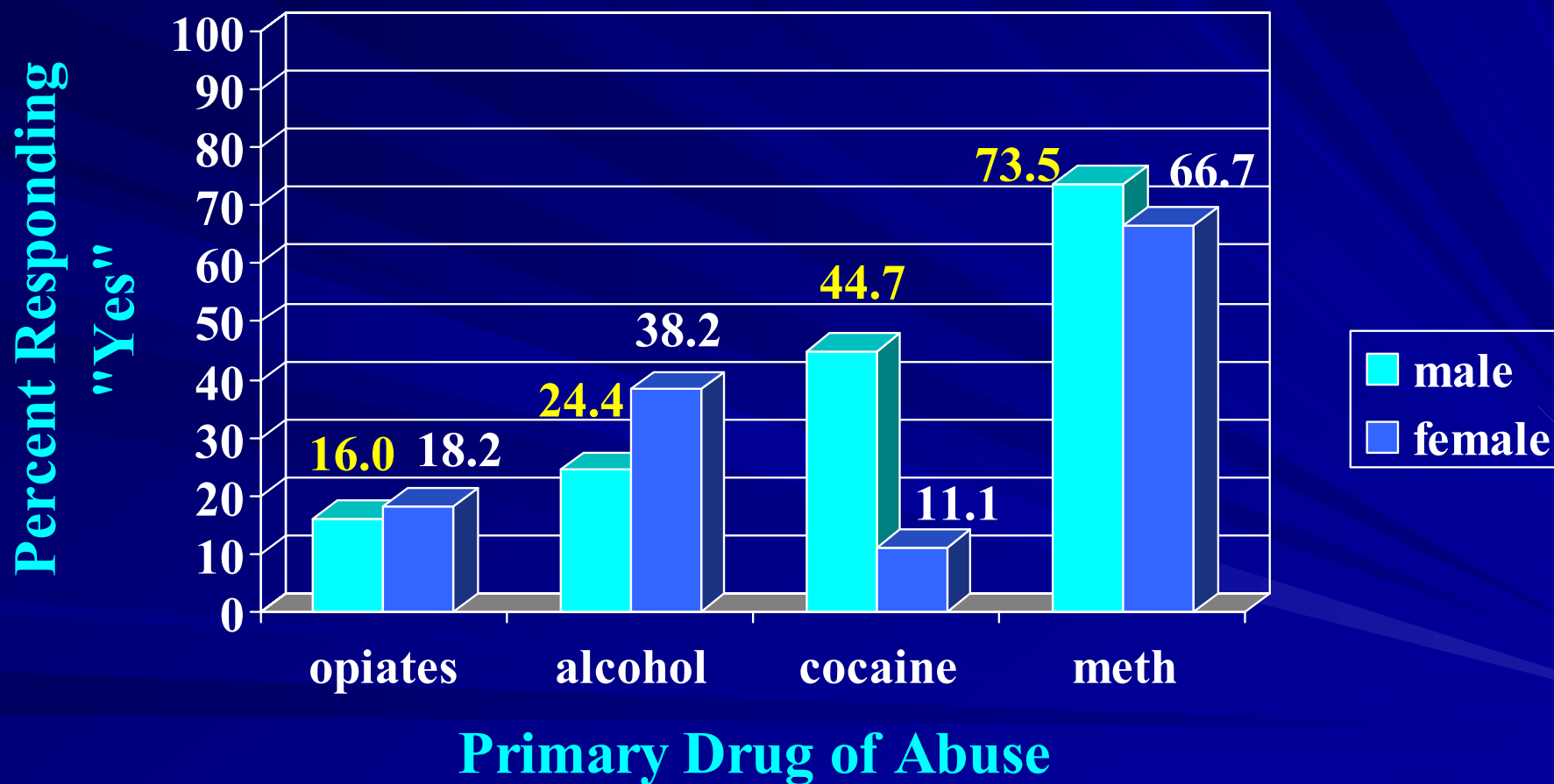
Methamphetamine and Sex

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



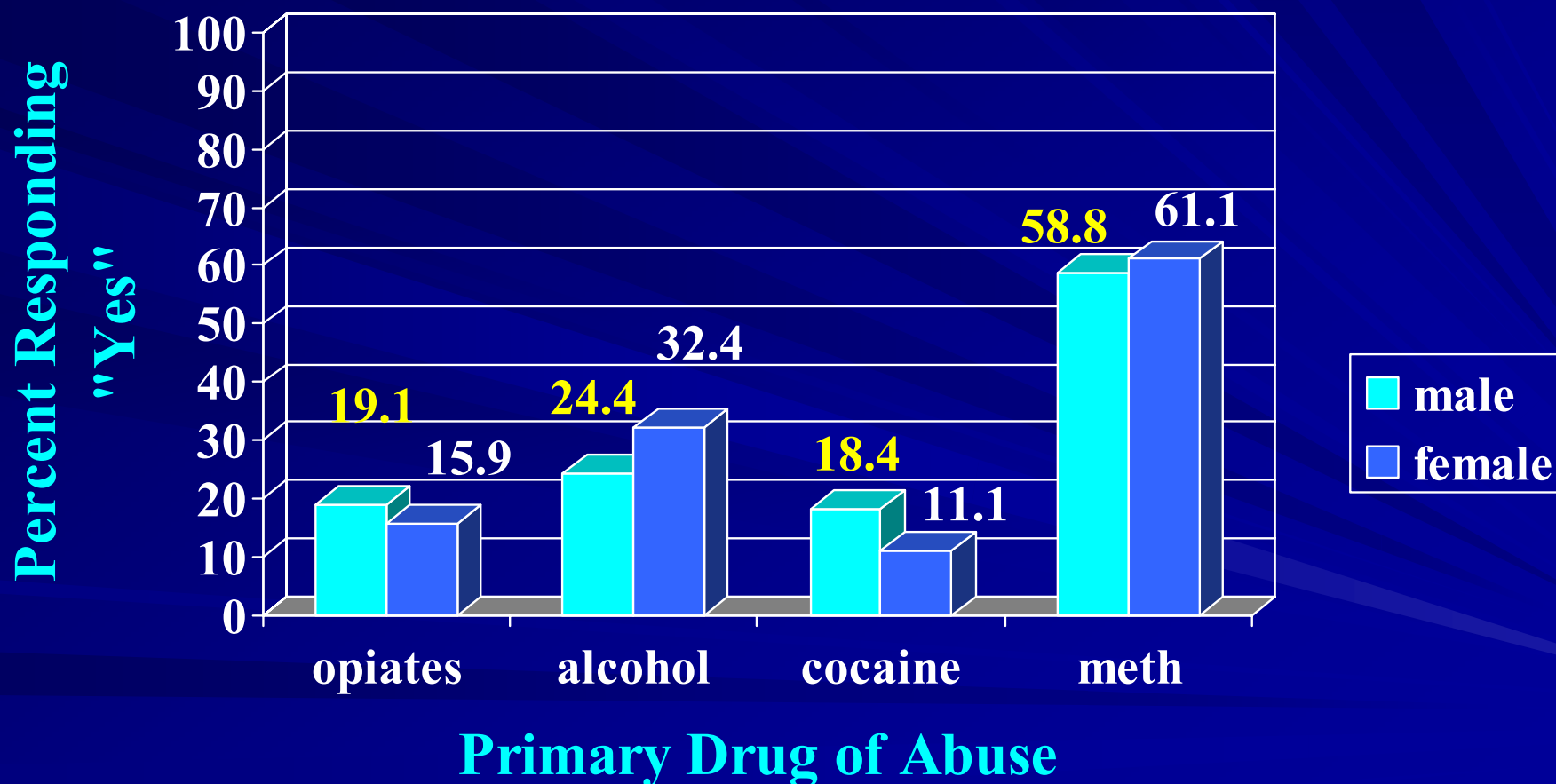
(Rawson et al., 2002)

My sexual *pleasure* is enhanced by the use of ...



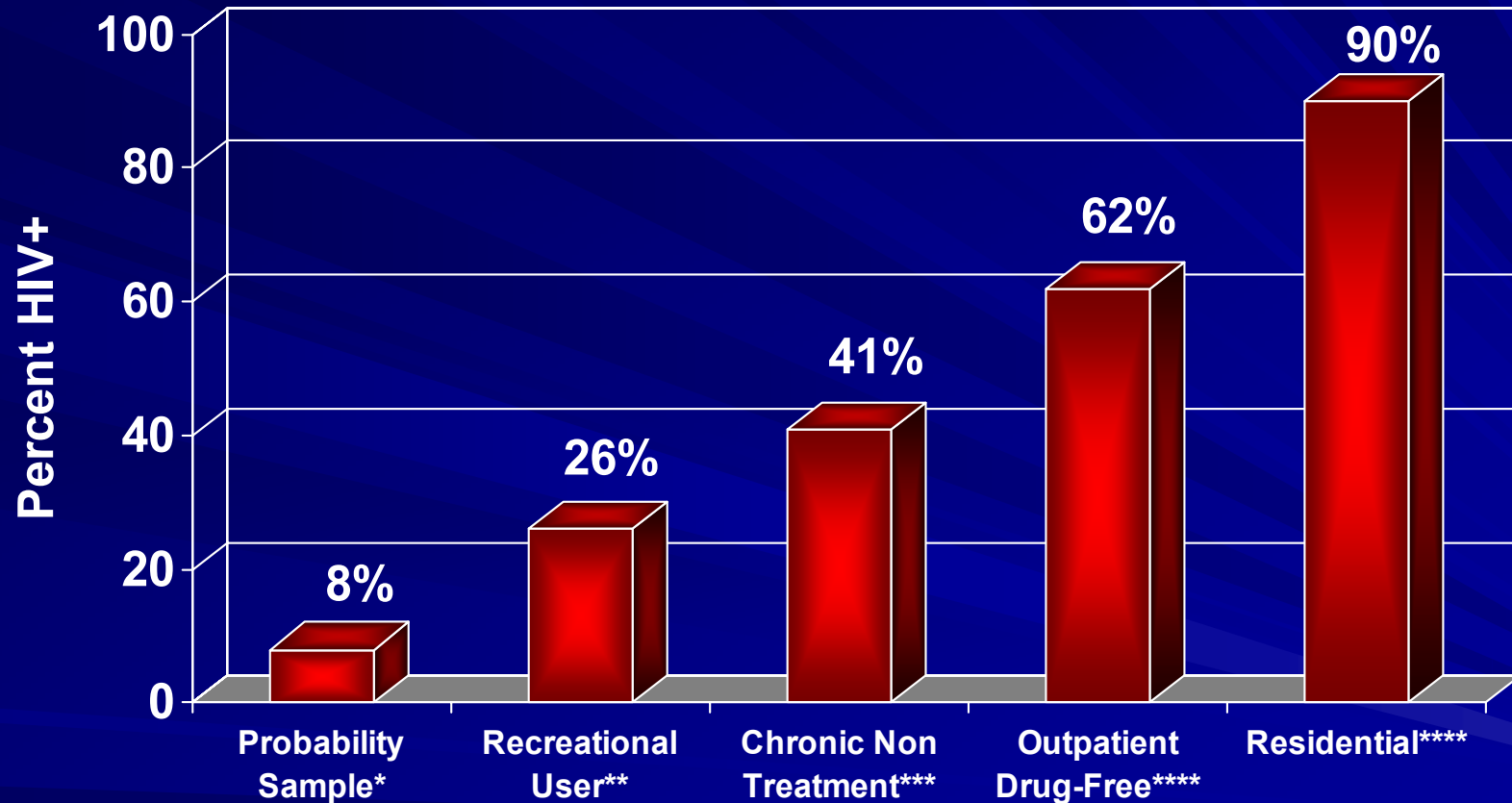
(Rawson et al., 2002)

My sexual performance is improved by the use of ...



(Rawson et al., 2002)

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



* Deren et al., 1998, Molitor et al., 1998; ** Reback et al., in prep,
*** Reback, 1997; **** Shoptaw et al., 2002; ****VNRH, unpublished data

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

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