

# Matrix Model Overview

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Matrix Institute on Addictions

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# Matrix Institute Overview

# Matrix: Overview

- 3 Outpatient drug-free programs (Adult and adolescent)
  - West Los Angeles
  - San Fernando Valley (L.A.)
  - Rancho Cucamonga (East of L.A.)
- 1 Narcotic Treatment Program (NTP)-South L.A.
- Established 1984

# Matrix: Overview

- **Public and private funding**
  - Los Angeles and San Bernardino Counties
  - Prop. 36 and Drug Court
  - CSAT funding
  - Private Insurance and cash
- **Research**
  - NIDA projects/UCLA investigators
  - Medication trials (modafinil, topiramate, bupropion, buprenorphine)

# Matrix Model: an EBP

- SAMHSA National Registry of Evidence-based Programs and Practices (NREPP)

<http://www.nrepp.samhsa.gov/>

# Matrix Institute Overview

- Evidence-based requirements
- Methamphetamine treatment experience
- Training and dissemination
  - The Hazelden Manuals (English and Spanish)
  - CSAT Manual: Matrix Model for stimulant users
  - Matrix Manual for Native Americans
- Over 2000 agencies in 50 states
- Thailand, Viet Nam, Mexico, South Africa

# Matrix Institute History

- Established 1984
- Treatment system was oriented toward alcohol and heroin users
- Cocaine epidemic
  - No tissue dependence by contrast to heroin users
  - Brief periods of use by contrast to alcohol users
  - Powerful conditioned cravings
  - Relapse the key issue
  - Matrix began as a response to the cocaine epidemic

# The Matrix Model

- Components
- Structure/schedule
- Approach
- Content

# Treatment Components of the Matrix Model

- Individual Sessions
- Early Recovery Groups
- Relapse Prevention Groups
- Family Education Group
- 12-Step Meetings
- Social Support Groups
- Urine Testing

# 16-week Matrix Program Schedule (Sample)

<u>Monday</u>	<u>Wednesday</u>	<u>Friday</u>
<u>Weeks 1-4</u> Early Recovery Skills	<u>Weeks 1-12</u> Family/Education	<u>Weeks 1-4</u> Early Recovery Skills
<u>Weeks 1-16</u> Relapse Prevention	<u>Weeks 13-16</u> Social Support	<u>Weeks 1-16</u> Relapse Prevention

Urine and breath alcohol tests once per week, weeks 1-16  
Ten Individual/Conjoint sessions during 1<sup>st</sup> 16 weeks

# Matrix Model Approach

## Organizing Principles

- Establish positive, collaborative relationship with patient; accepting and non-judgmental
- Teach information on addiction and recovery; cognitive-behavioral concepts; relapse prevention
- Educate family regarding addiction and recovery

# Matrix Model Approach

## Organizing Principles

- Introduce and encourage self-help participation
- Use urinalysis to monitor drug use
- “Ambivalence” or confusion is normal
- Keep them coming back

# Matrix Model Content Information

- **A Key Premise**
  - **Classical conditioning and craving**
  - **The brain and addiction**
  - **Confusion vs denial**

# Information: Conditioning



**Pavlov's Dog**

# Information: Conditioning



**Pavlov's Dog**

# Conditioning Process During Addiction

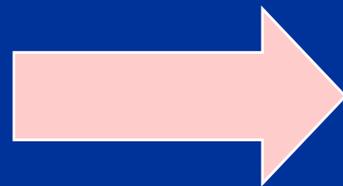
## *Introductory Phase*

### Strength of Conditioned Connection

#### Triggers

- Parties
- Special Occasions

Mild



#### Responses

- Pleasant Thoughts about AOD
- No Physiological Response
- Infrequent Use

# Cognitive Process During Addiction

## *Introductory Phase*

### Relief From

Depression

Anxiety

Loneliness

Insomnia

Euphoria

Increased Status

Increased Energy

Increased Sexual/Social Confidence

Increased Work Output

Increased Thinking Ability



**AOD**

**May Be Illegal**

**May Be Expensive**

**Hangover/Feeling Ill**

**May Miss Work**



# Cognitive Process During Addiction

## *Disenchantment Phase*

**Social Currency**

**Occasional Euphoria**

**Relief From Lethargy**

**Relief From Stress**

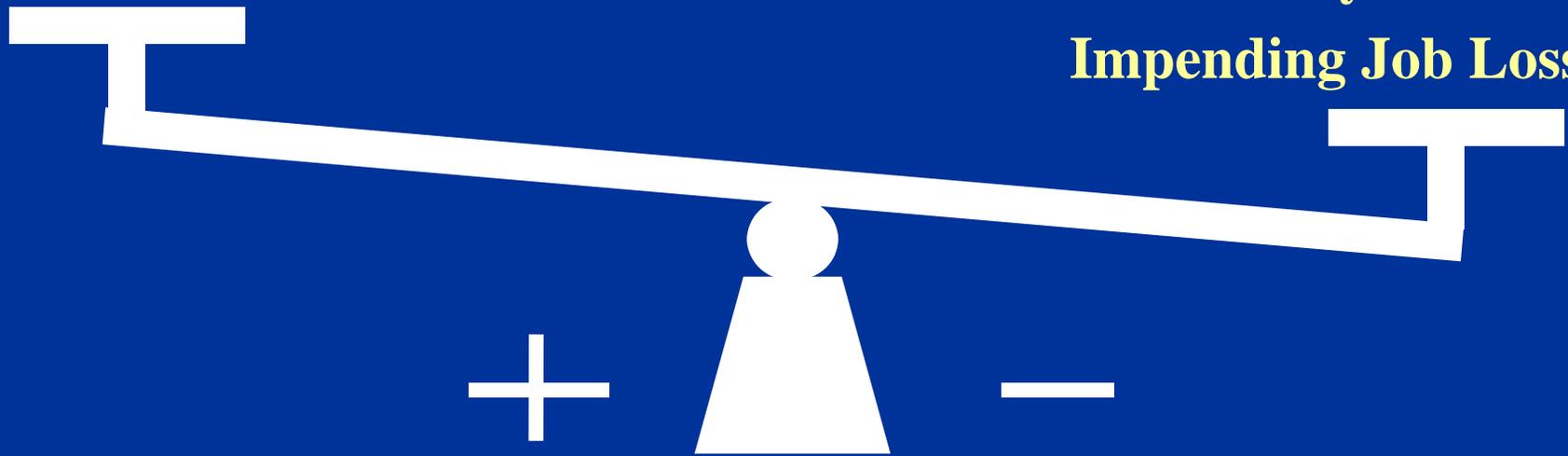
**Nose Bleeds**

**Infections**

**Relationship Disruption**

**Family Distress**

**Impending Job Loss**



# Development of Craving Response

## *Addiction Phase*

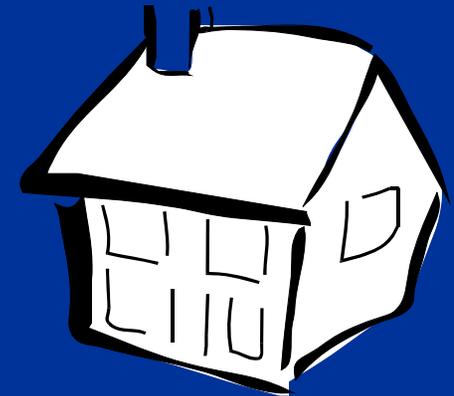
### Thinking of Using



### Mild Physiological Response

↑ Heart Rate  
↑ Breathing Rate  
↑ Energy  
↑ Adrenaline Effects

### Entering Using Site



### Powerful Physiological Response

↑ Heart Rate  
↑ Breathing Rate  
↑ Energy  
↑ Adrenaline Effects

### Use of AODs

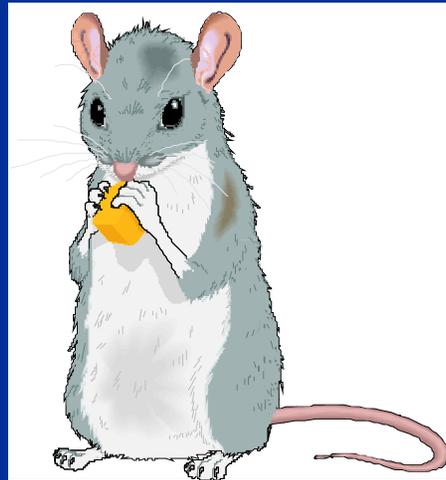


### AOD Effects

Heart  
Blood Pressure  
Energy

# Potency of Cravings

DRUG



# Message from the Brain

- “You need this to survive”

# Conditioning and the Brain: Message to Patients

- Will power, good intentions are not enough
- Behavior needs to change
- Insight will not affect cravings
  
- Deal with cravings: avoid triggers
- Deal with cravings: thought-stopping
- Scheduling

# Breaking Down Triggers: People

- **Drug-using friends/dealer**
- **Voices of drug friends/dealer**
- **Absence of significant other**
- **Sexual partners**
- **Groups discussing drug use**

# Breaking Down Triggers: Places

- **Drug dealer's home**
- **Bars and clubs**
- **Drug use neighborhoods**
- **Freeway offramps**
- **Worksite**
- **Street corners**

# Breaking Down Triggers: Things

- **Paraphernalia**
- **Sexually explicit magazines/movies/internet**
- **Money/bank machines**
- **Music**
- **Movies/TV shows about alcohol and other drugs**
- **Secondary alcohol or other drug use**

# Breaking Down Triggers: Times

- **Periods of idle time**
- **Periods of extended stress**
- **After work**
- **Payday/AFDC payment day**
- **Holidays**
- **Friday/Saturday night**
- **Birthdays/Anniversaries**

# Breaking Down Triggers: Emotional States

- ◆ **Anxiety**
- ◆ **Anger**
- ◆ **Frustration**
- ◆ **Sexual arousal**
- ◆ **Gradually building emotional states with no expected relief**
- ◆ **Fatigue**
- ◆ **Boredom**
- ◆ **Adrenalized states**
- ◆ **Sexual deprivation**

# Matrix Model Content Information

## The Roadmap to Recovery

# Information: Roadmap for Recovery



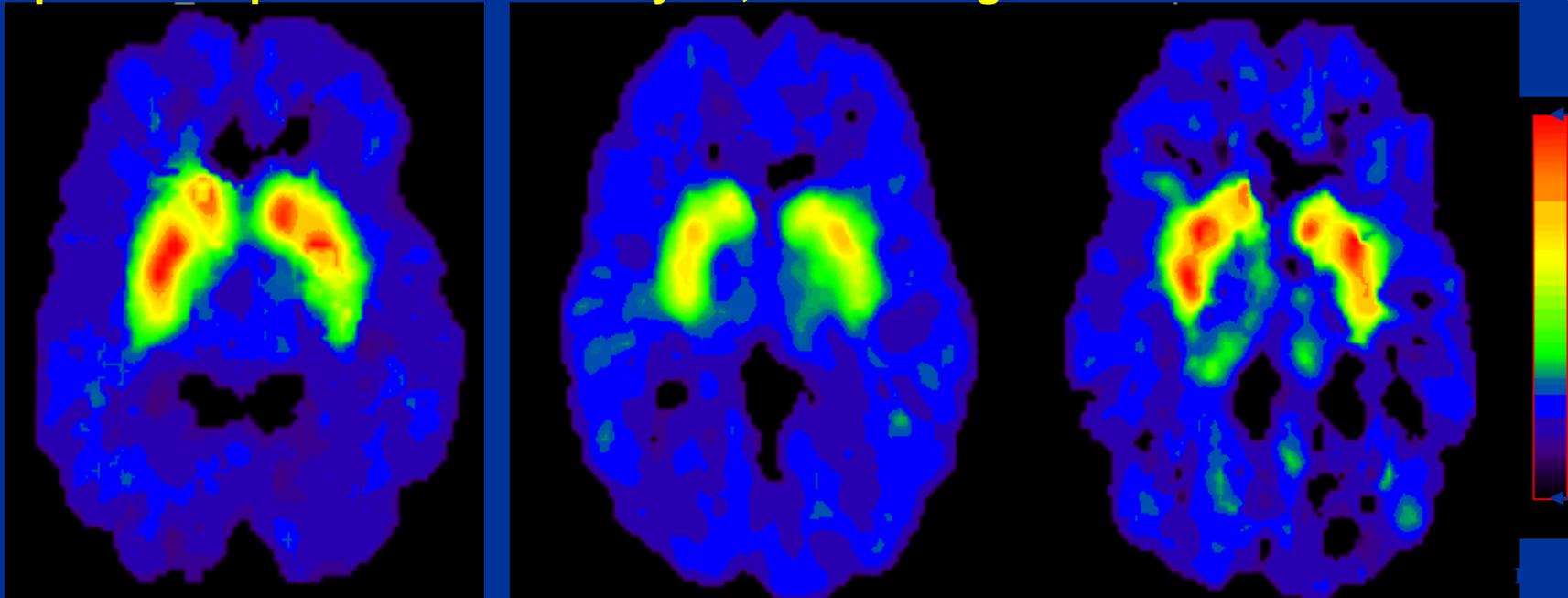
- **Withdrawal**
- **Early Abstinence, Honeymoon**
- **Protracted Abstinence, the Wall**
- **Adjustment/Resolution**

# Information Examples

- **Protracted Abstinence: “The Wall”**
- **45-120 days after last use**

# Partial Recovery of Brain from Methamphetamine After Abstinence

Dopamine improvements after 1 year, but not cognitive and motor functioning



Normal Control

METH Abuser  
(1 month abstinent)

METH Abuser  
(14 months abstinent)

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

Dopamine improvements after 1 year, but not cognitive and motor functioning

# Roadmap for Recovery

**Return to Old Behaviors**

**Anhedonia**

**Anger**

**Depression**

**THE WALL**

**Emotional Swings**

**Unclear Thinking**

**Isolation**

**Family Problems**

**Cravings Return**

**Abstinence Violation**

*Protracted Abstinence*

# The Wall

- Treatment implications
  - Simple
  - Redundant
  - Frequent visits for an extended period
- Message to patients
  - It takes a while for your brain to heal
  - Don't make mistakes explaining your feelings
  - Be patient; Don't give up

# Matrix Model Groups

# Matrix Model Groups

- Focus on the present
- Focus on behavior vs. feelings
- Structured, topics, information, analysis of behavior
- Drug cessation skills and relapse prevention
- Lifestyle change in addition to not using

# Matrix Model Groups

- Therapist frequently pursues less motivated clients
- Non-confrontational; must be safe
- Goal is abstinence; relapse is tolerated

# Early Recovery Skills Group Topics

- Drug cessation
- Identify triggers
- Get rid of paraphernalia
- Avoid triggers-schedule time
- Thought-stopping for cravings
- 12-step introduction

# Early Recovery Skills Group

- Establishing structure
  - Time scheduling
  - Attending treatment and 12-Step meetings
  - Exercising
  - Work or school
  - Church
  - Scheduled leisure

# Relapse Prevention Group

## What happens in group:

- Introduction of new members
- Review topic 30-45 minutes and discuss
- Discuss problems, progress, and plans for 30-45 minutes
- Focus on the recent past and immediate future

# Relapse Prevention Groups

- **Relapse Prevention**
  - Patients need to develop new behaviors
  - Recovery is more than not using D.O.C.
  - Recovery is more than not using drugs and alcohol
  - Learn to monitor signs of vulnerability to relapse

# Relapse Prevention Topics

- Relapse Prevention
  - Overview of the concept; things don't "just happen"
- Using Behavior
  - Old behaviors need to change
  - Re-emergence signals relapse risk (it's a duck)
- Relapse Justification
  - "Stinking thinking"
  - Recognize and stop

# Relapse Prevention Topics

- **Dangerous Emotions**
  - Loneliness, anger, deprivation
- **Be Smart, not Strong**
  - Avoid the dangerous people and places
  - Don't rely on will power
- **Avoiding Relapse Drift**
  - Identify "mooring lines"
  - Monitor drift

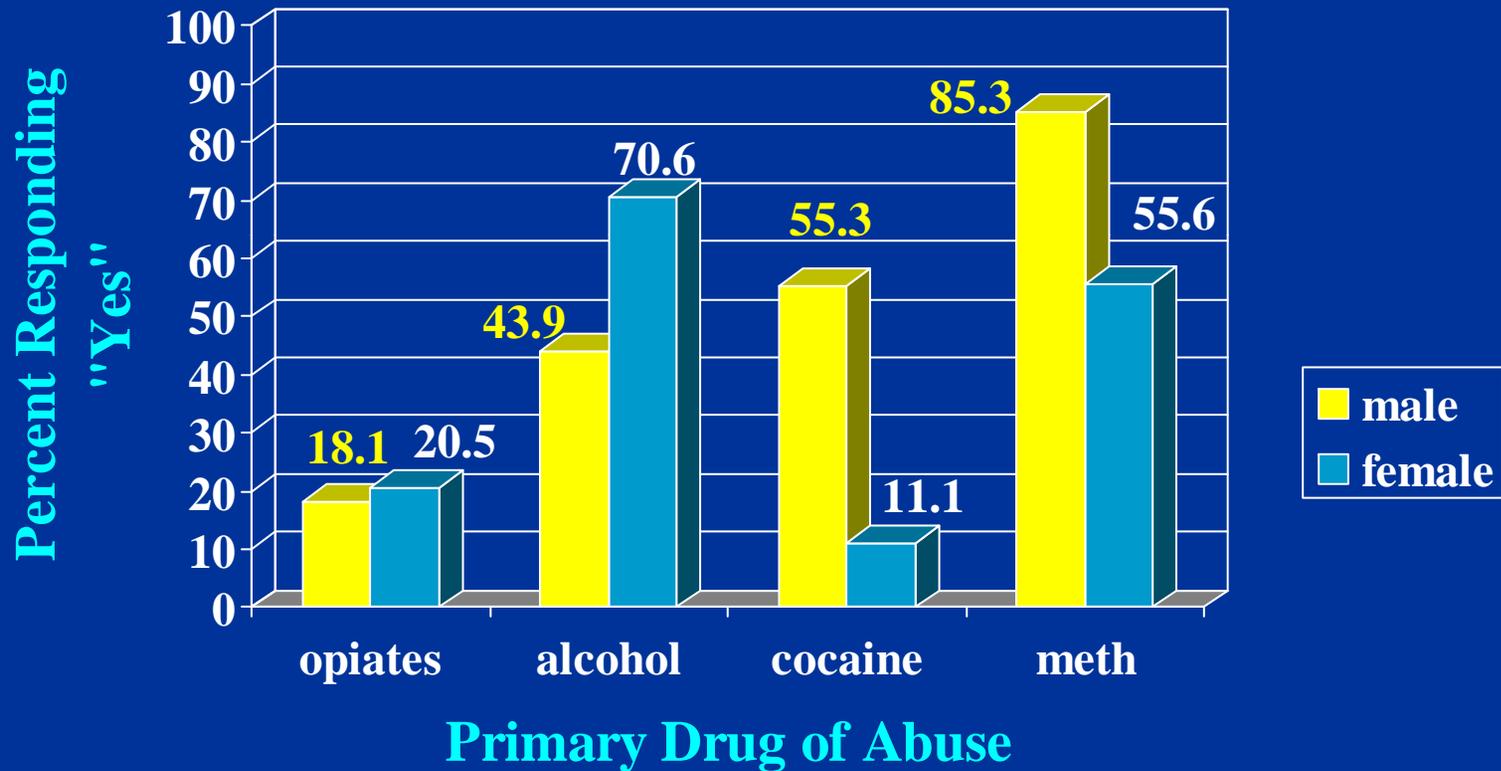
# Relapse Analysis

- Session to be done when relapse occurs after a period of sobriety
- Functional analysis
- Continued drug use is better addressed with Early Recovery topics
- Relapse should be framed as learning experience for client

# Relapse and Sex

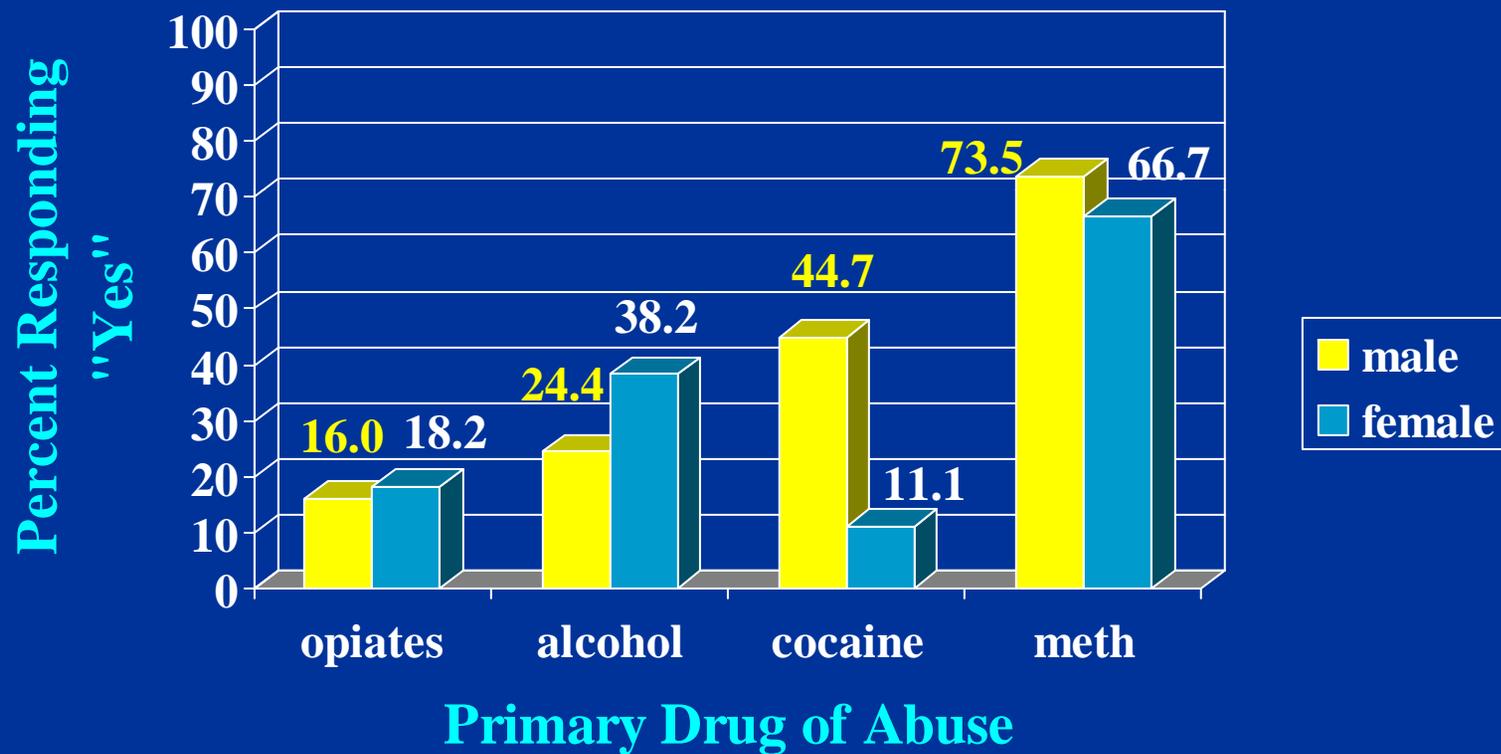
- Part of the challenge of treatment
- Particularly Methamphetamine treatment

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



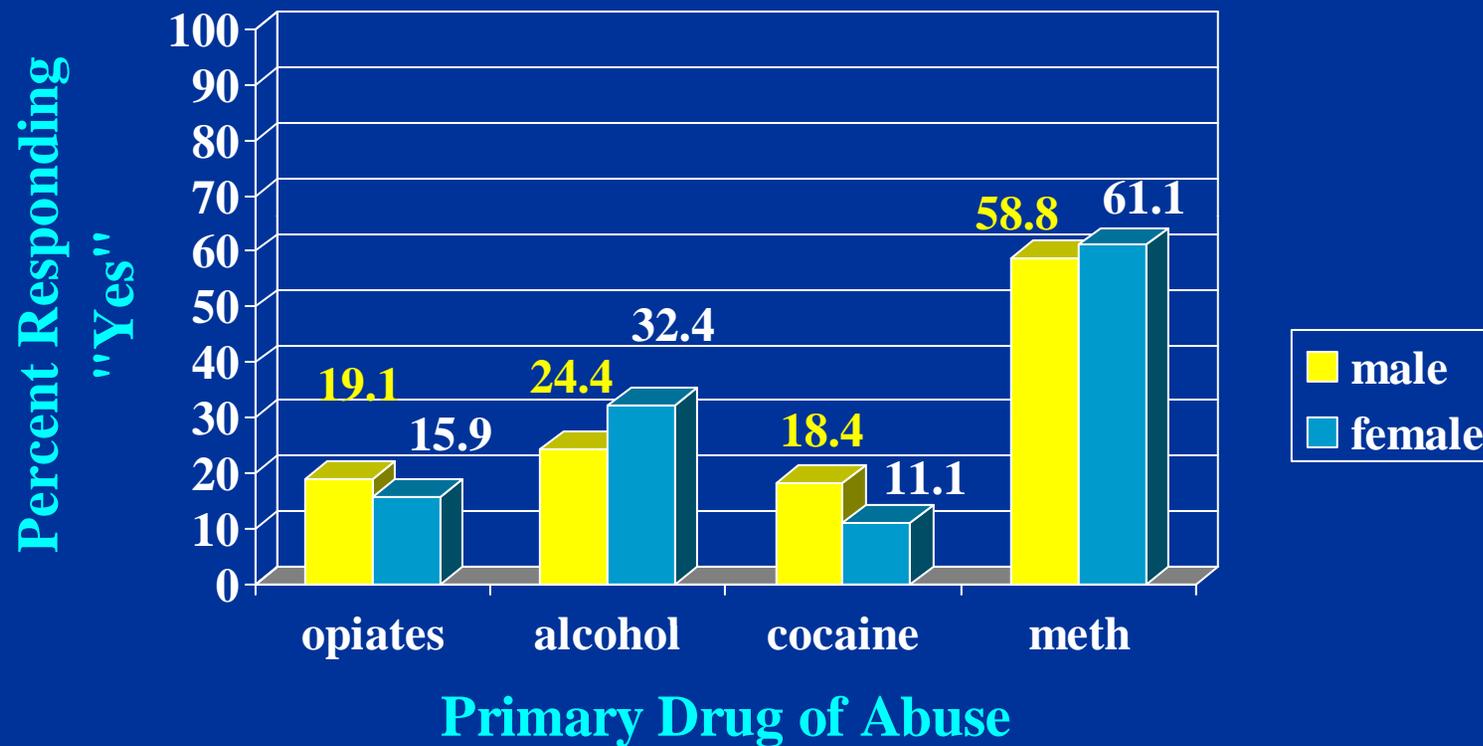
(Rawson et al., 2002)

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



(Rawson et al., 2002)

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

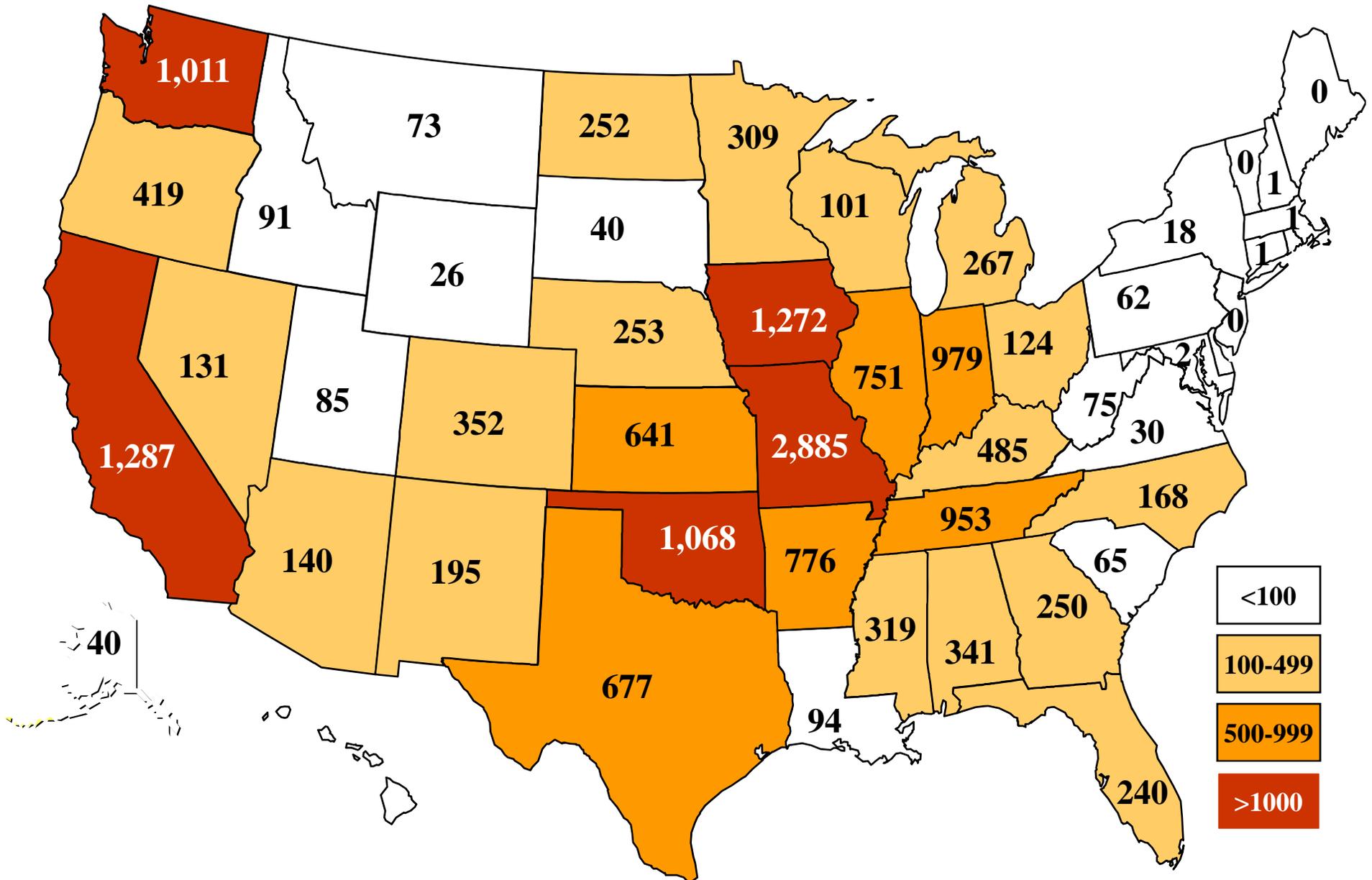


(Rawson et al., 2002)

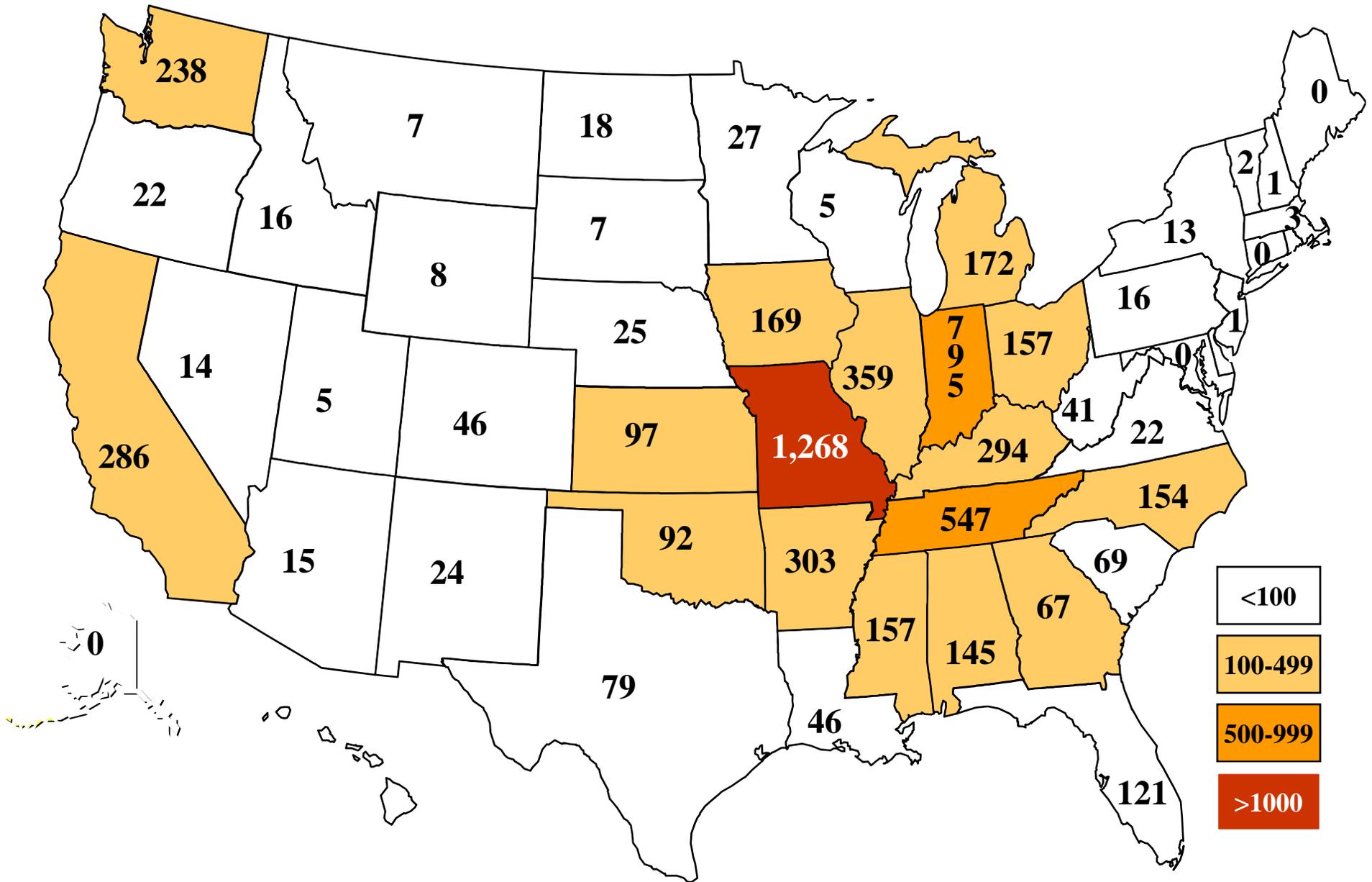
# Methamphetamine: the “5%” Myth

- **Myth: Only 5% of meth users are successful in treatment**
- **Wide dissemination may be self-fulfilling**
  - **Communities won't support treatment**
  - **Funders won't fund treatment**
  - **Meth users won't enter treatment**
  - **Practitioners won't expect treatment to work**

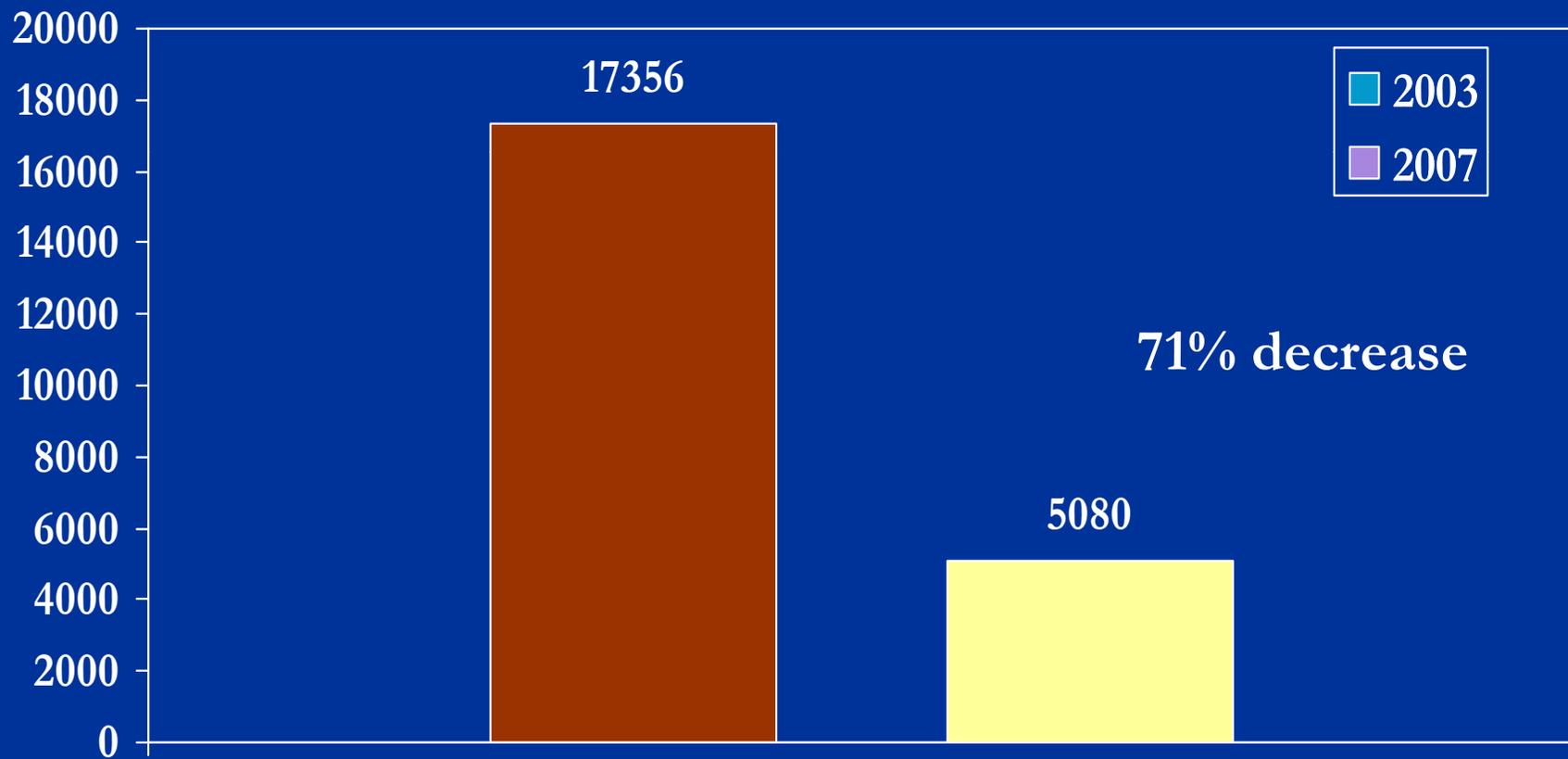
# Clandestine Lab Incidents: 2003



# Clandestine Lab Incidents: 2007



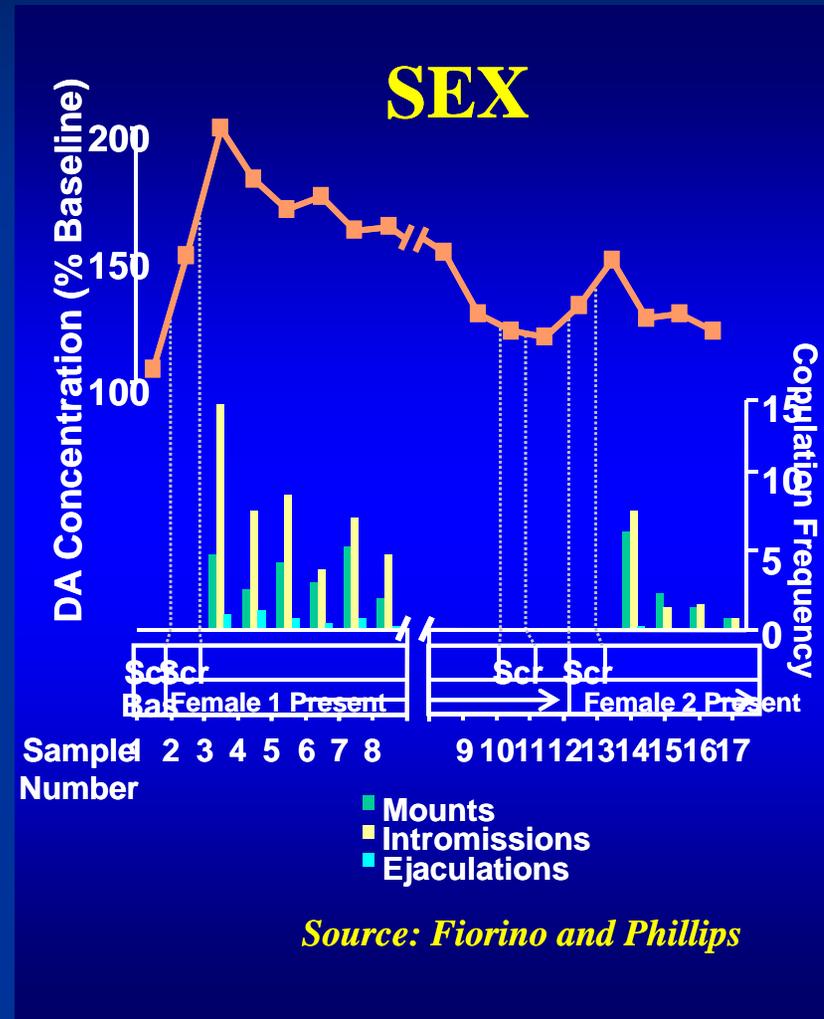
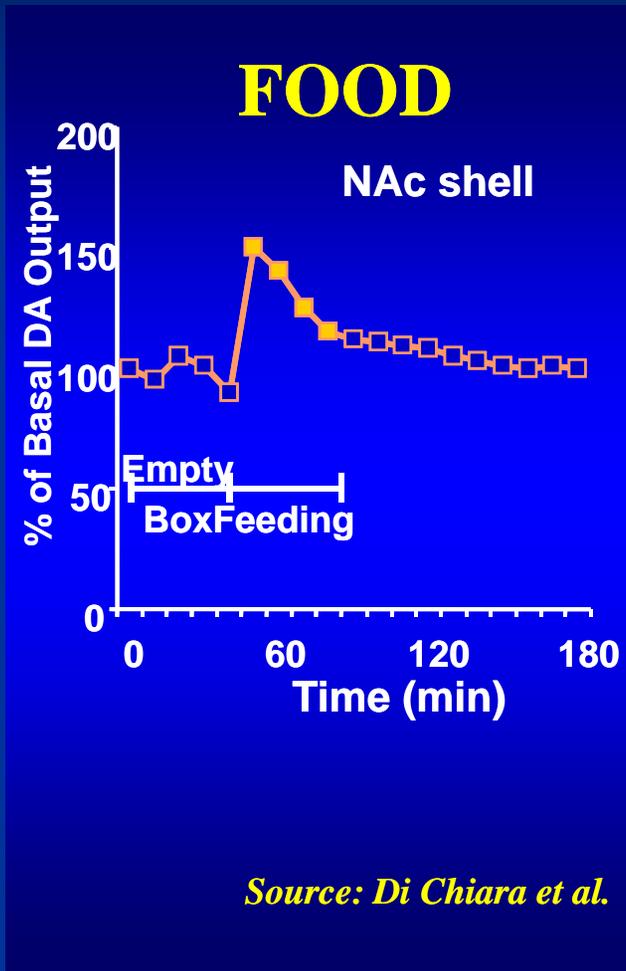
# Meth Lab Incidents: 2003 and 2007



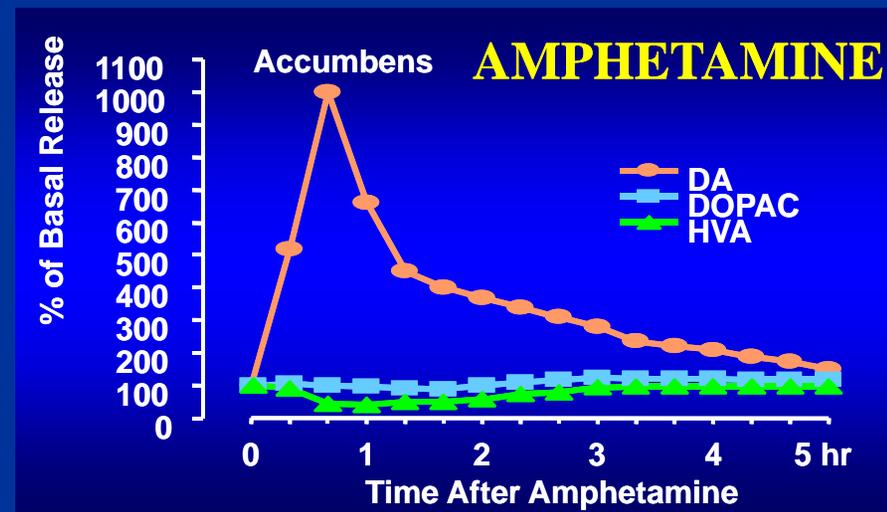
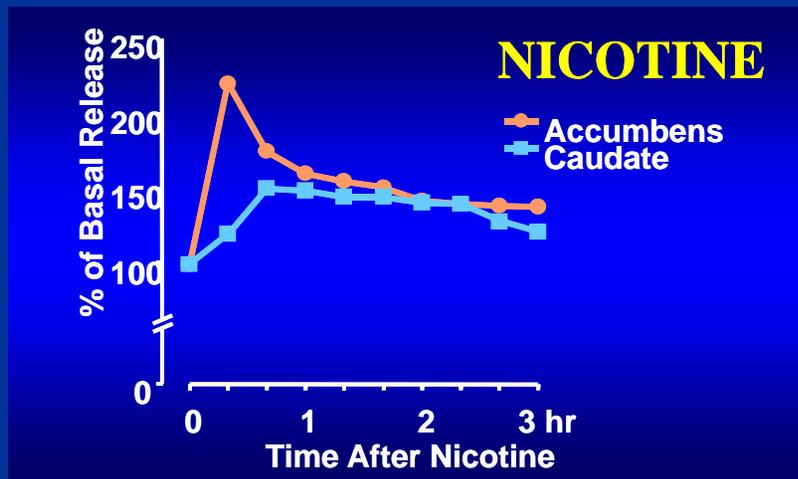
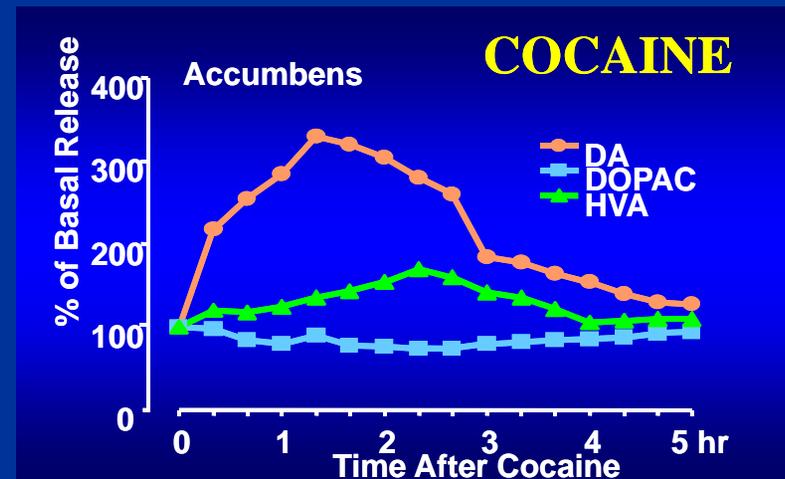
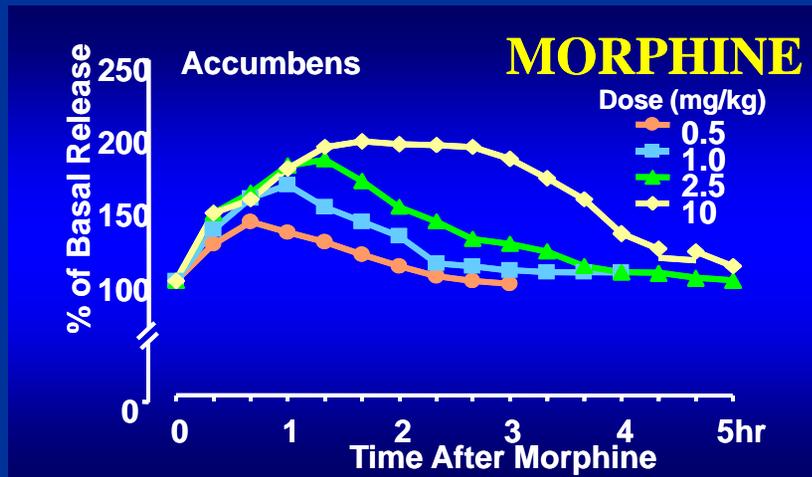
# Meth Treatment is Challenging

- Very euphoric
- Prolonged meth use changes the brain
- Cognitive and emotional consequence of use can last months or years

# Natural Rewards Elevate Dopamine Levels



# Effects of Drugs on Dopamine Levels



Source: Di Chiara and Imperato

# Meth Treatment is Challenging

- Prolonged effects require appropriate treatment approaches (reminders, simplicity, redundancy)
- Impairment may not be obvious

# Comparison of Meth and Cocaine Users

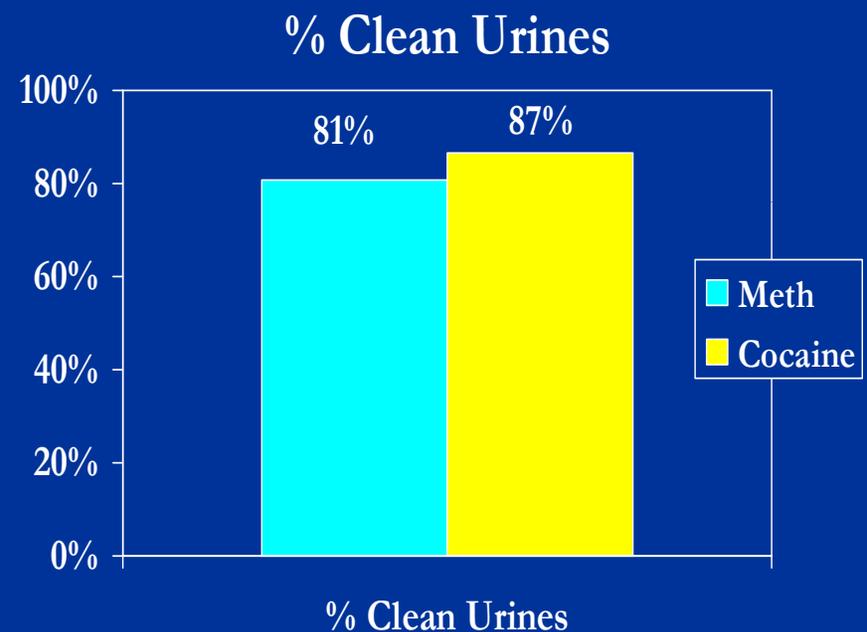
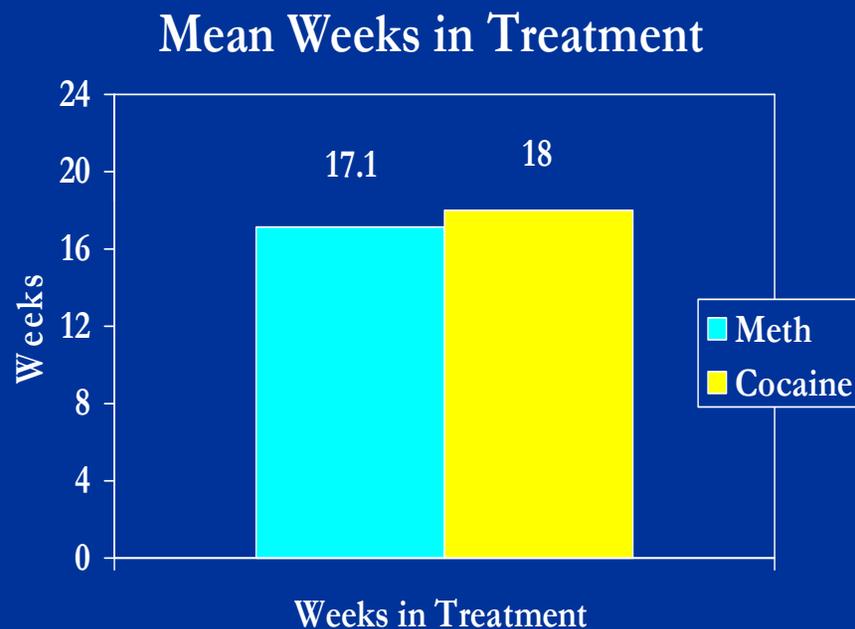
Rawson et al., 2000, Journal of Psychoactive Drugs

- 500 methamphetamine users
- 224 cocaine users
- Matrix San Bernardino County
- Identical program and staff

# Comparison of Meth and Cocaine Users

Rawson et al., 2000, Journal of Psychoactive Drugs

## ■ Identical treatment outcomes



# Matrix Model vs TAU

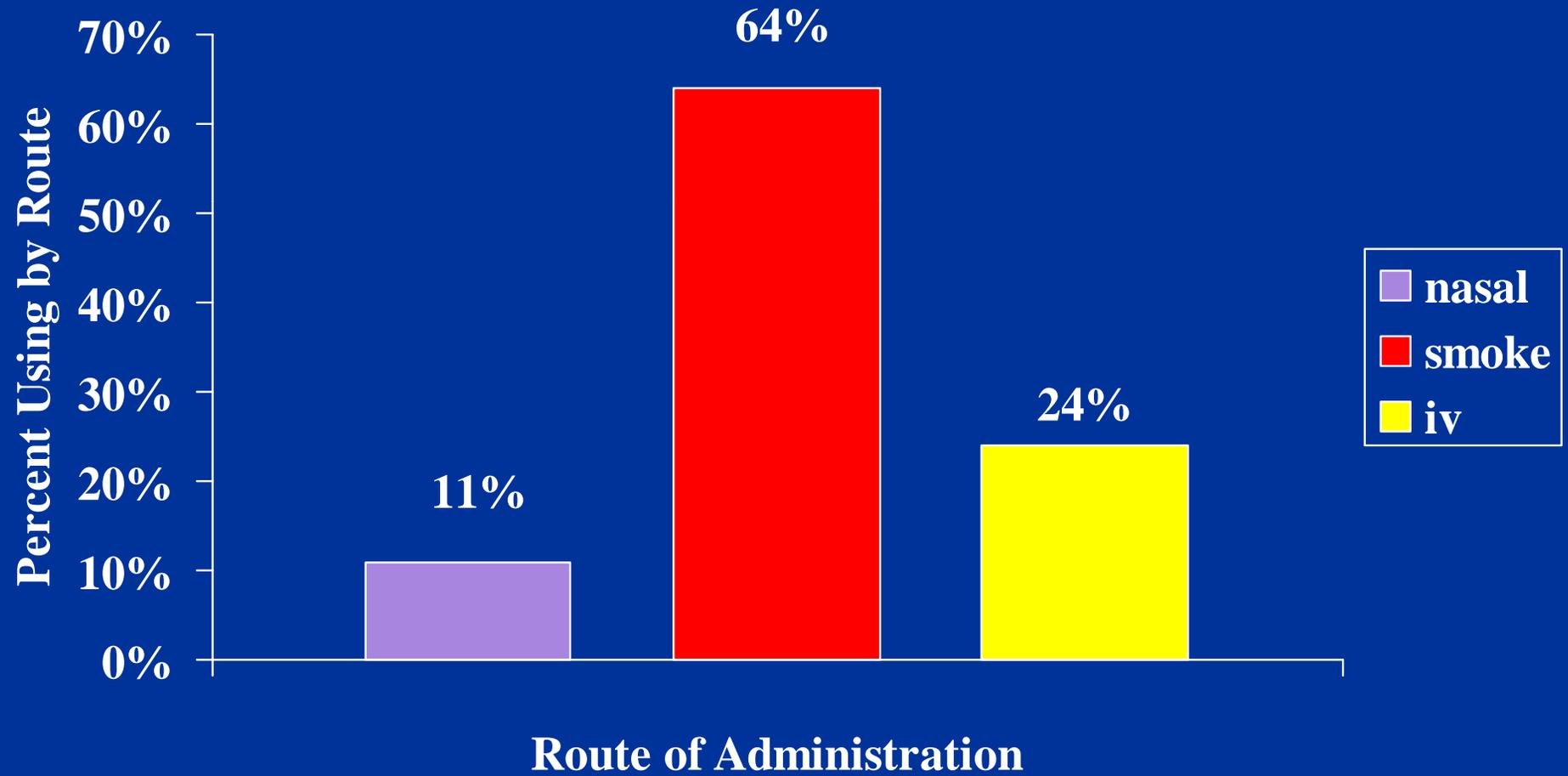
Rawson et al., 2004, Addiction

- 978 Methamphetamine users seeking treatment
- CSAT multi-site study; 1998-2002
  - Costa Mesa; San Diego; Hayward; Concord; San Mateo; Billings; Honolulu
- Matrix Model vs Treatment as Usual
- Random assignment

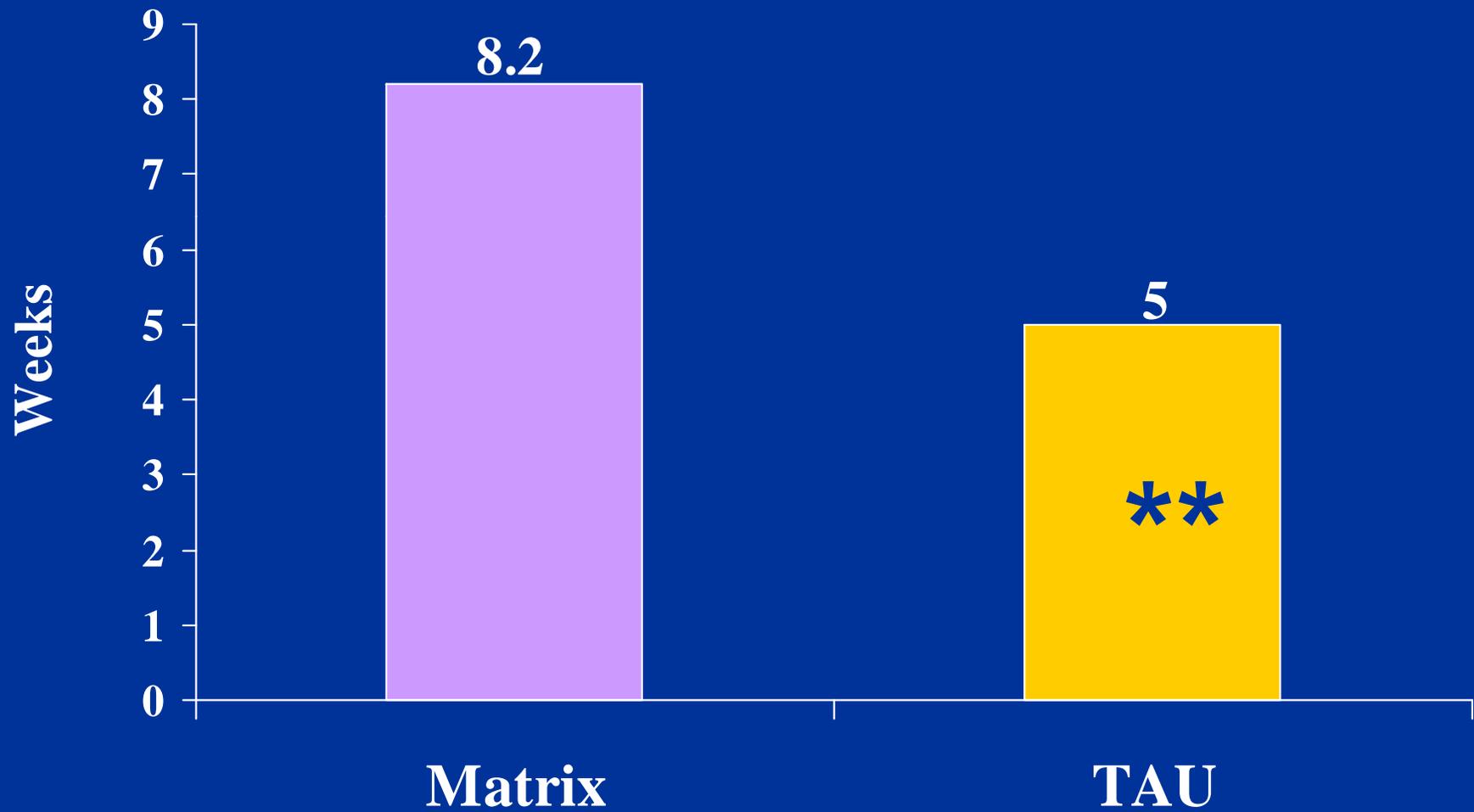
# Clinical Characteristics: Lifetime

- Sexual Abuse 20%
- Physical Abuse 52%
- Suicidal Thoughts 34%
- Attempted Suicide 21%
- Depression 60%
- Psychiatric Meds 32%

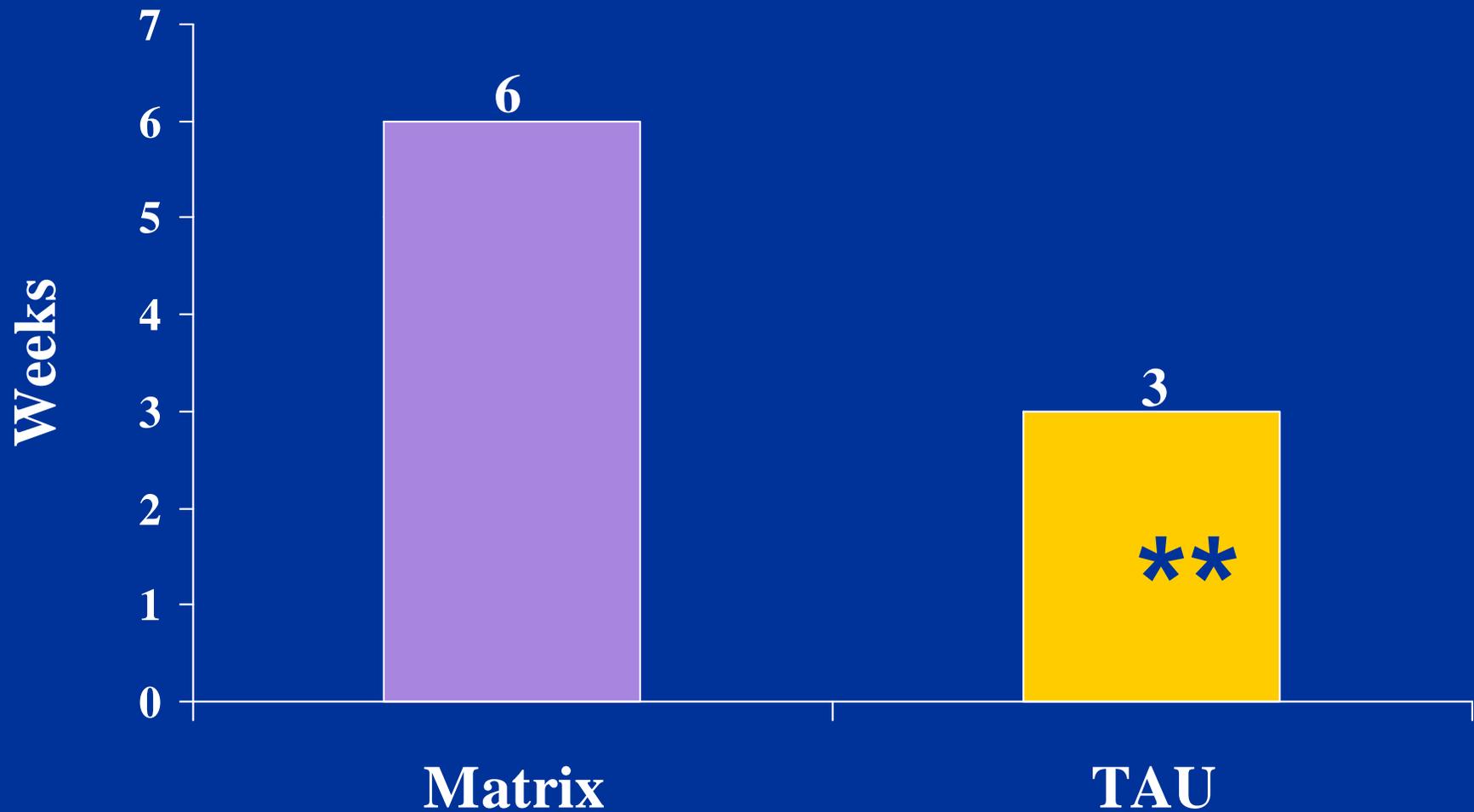
# Route of Methamphetamine Use



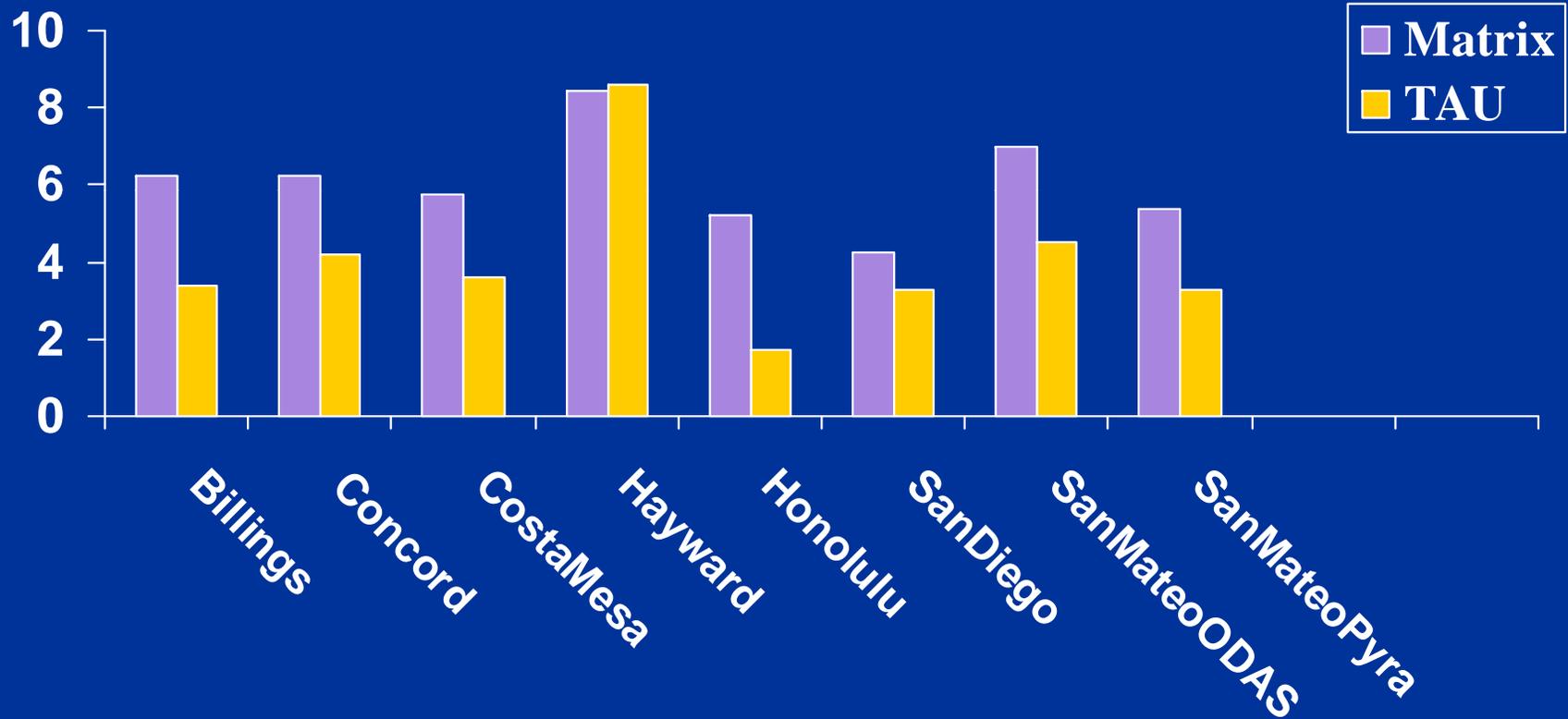
# Weeks in Treatment



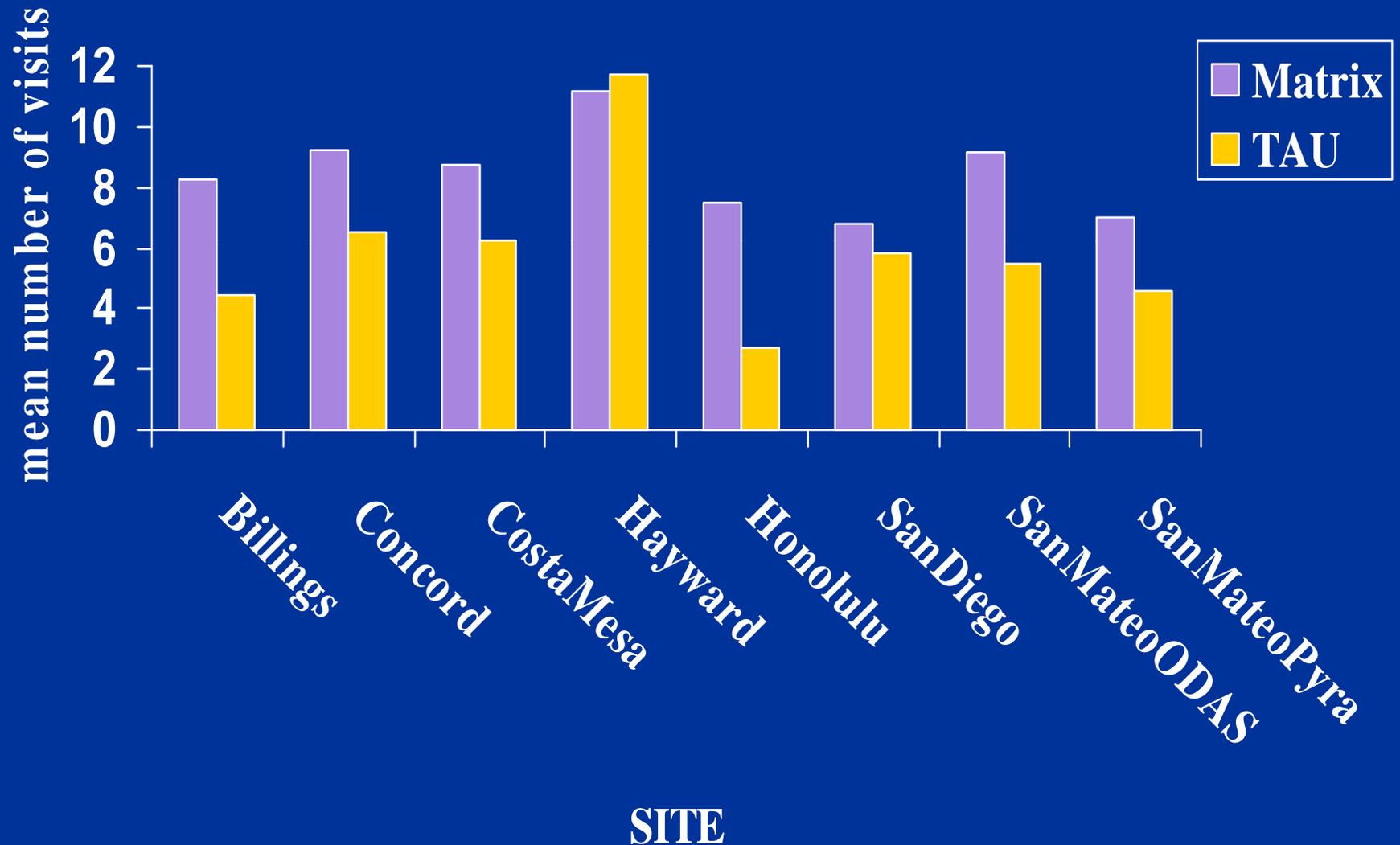
# Weeks Continuous Abstinence



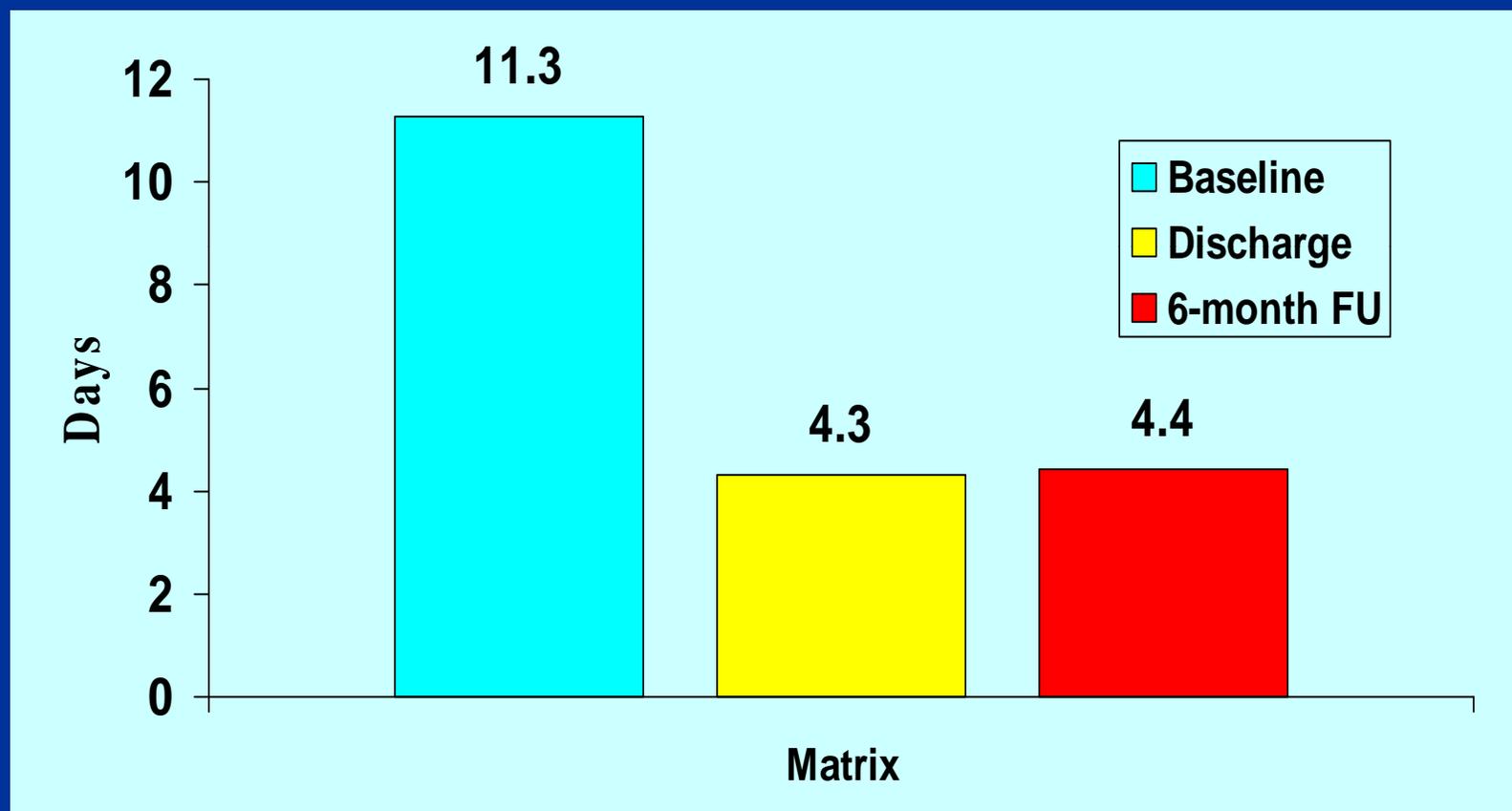
# Mean Number of UA's that were MA-free during treatment



# Mean Number of Weeks in Treatment



## Self-report of MA use during the past 30 days at baseline, discharge, and 6-month follow-up.



Matrix Model for Teens  
and Young Adults:  
Teen-ASI Outcomes

# Parent Support Groups and Teen Education Groups

- Parents and teens have separate groups with separate and distinct purposes.
- Meet weekly for the first 12 weeks of treatment. Some parents choose to stay in the Parent Support Group longer. The adolescents transition into the Social Support Group.

# Parent Support Group

- Offers parents a chance to learn skills to better manage the process of change within their family.
- The parents desire and need to share their experiences, challenges and successes.
- Specific parenting skills are addressed in each group.

# Teen Education Groups

- Delivered in an interactive, educational manner.
- There is exposure to current and accurate information that has the potential to change the teen's beliefs towards sobriety.

# Site Specific Ancillary Support Components

- Transportation
- Childcare
- Collaborations e.g., YMCA
- Youth activities Group
- Physical and social activities



# T-ASI Assessment Procedures

- **The T-ASI was administered at intake, 3 months following intake (clients were still in treatment), and 6 months after intake (2 months after completion of the intensive phase of treatment)**
- **Assessments were done by a research assistant, counselor, or intake worker.**

## Assessment Procedures

- Data were collected on 57 adolescents in publicly and privately-funded treatment at two clinics in Southern California.
- Assessments were done on 100% (n=57) at the 3-month point, and on 74% (n=42) at the 6-month follow-up.
- 6-month data are presented here.

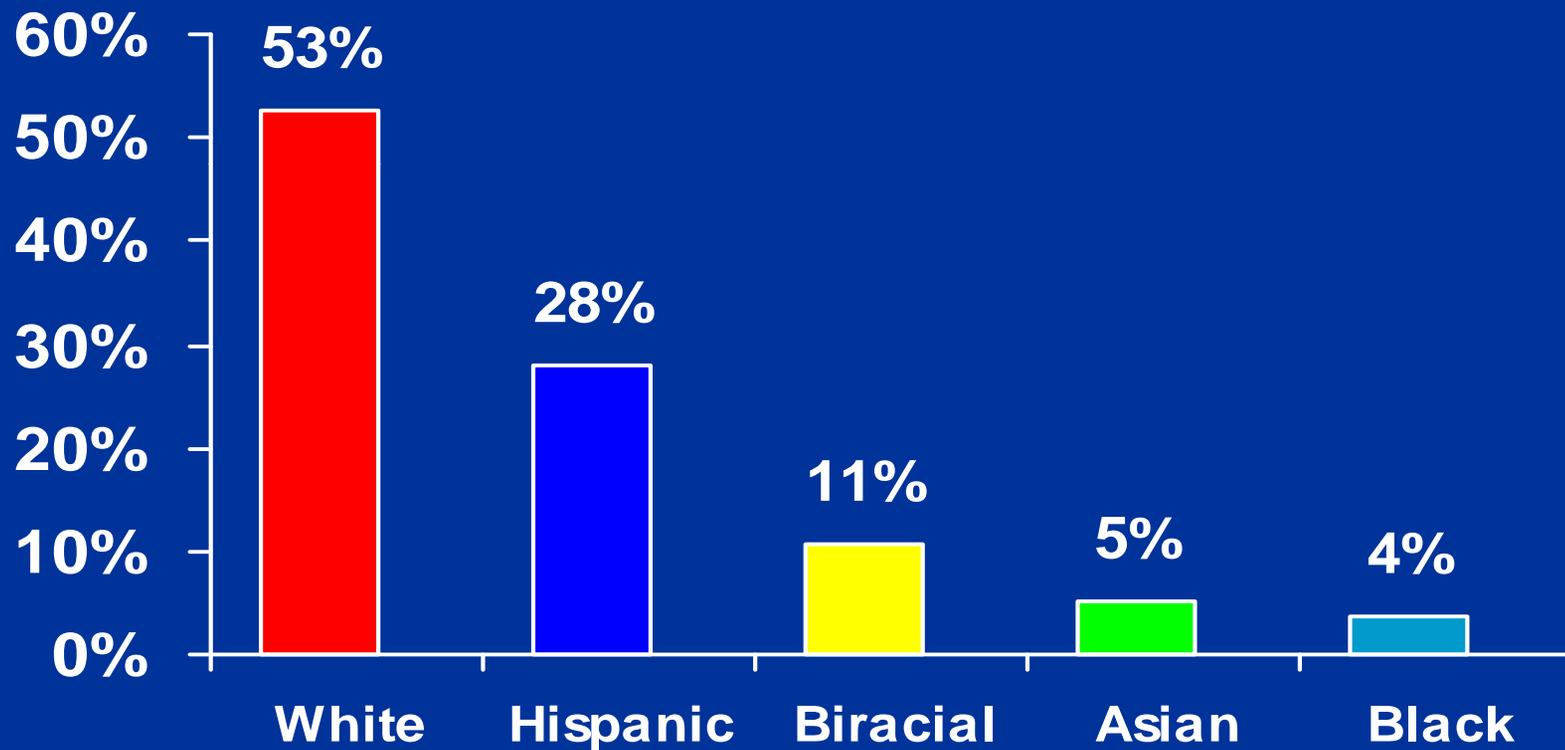
# Teen ASI

- The T-ASI (Kaminer et al., 1991, 1993) is a semi-structured interview.
- T-ASI assesses seven domains: chemical (drug and alcohol) use, school status, employment-support status, family relationships, peer-social relationships, legal status, and psychiatric status.

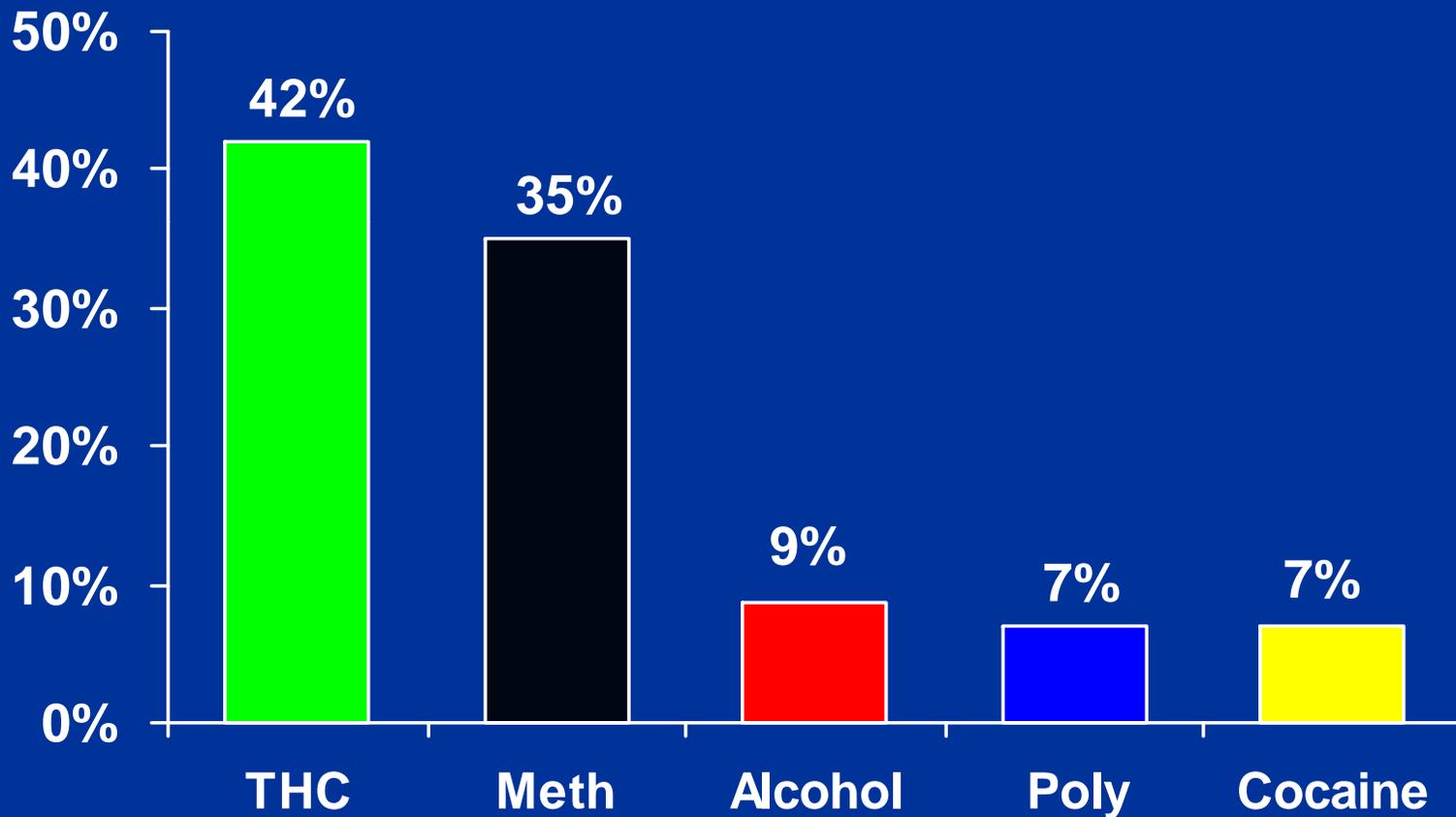
# Description of the Sample

- The mean age was 16.2 years (range 14-18)
- 44% were female.

## Race/Ethnicity

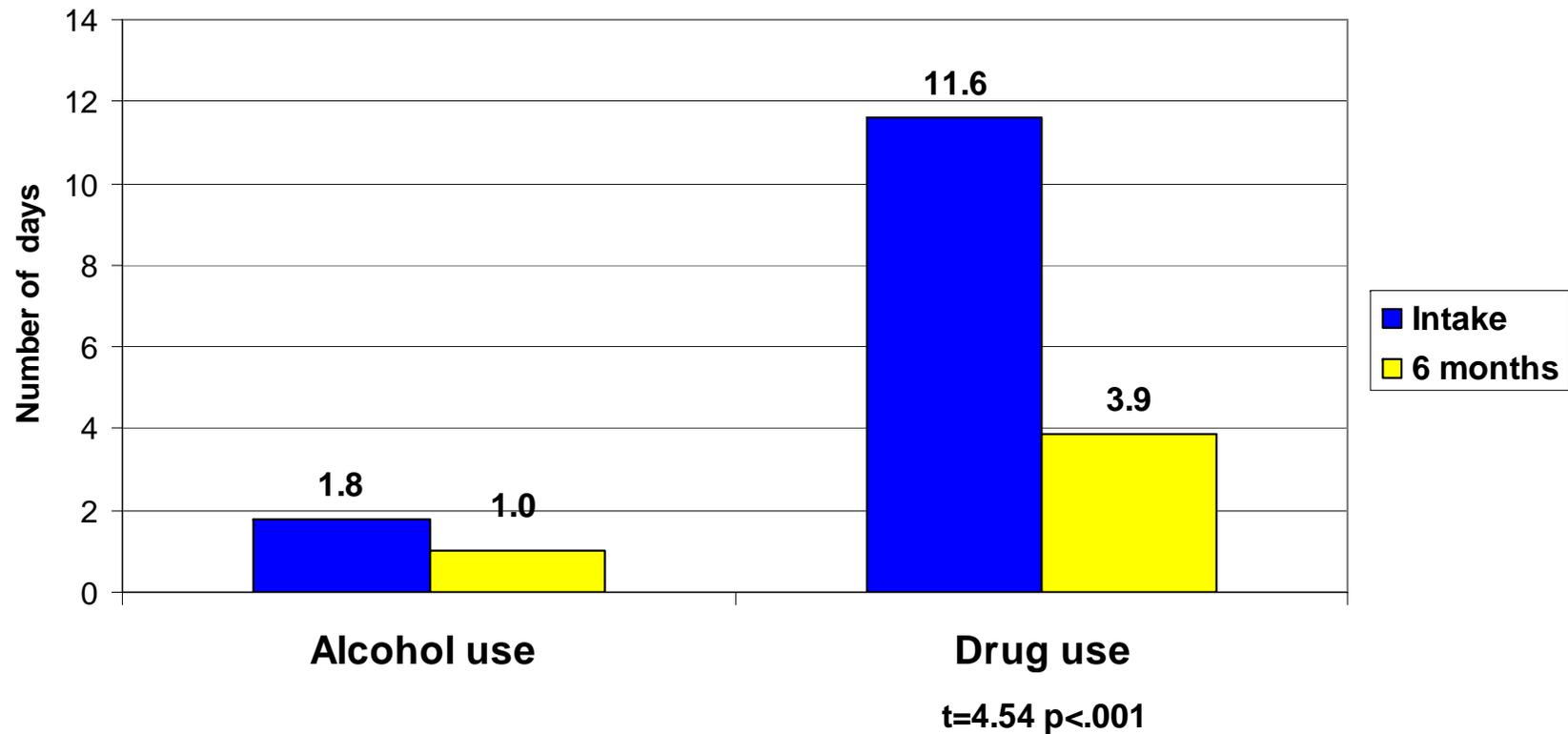


## Drug of Choice

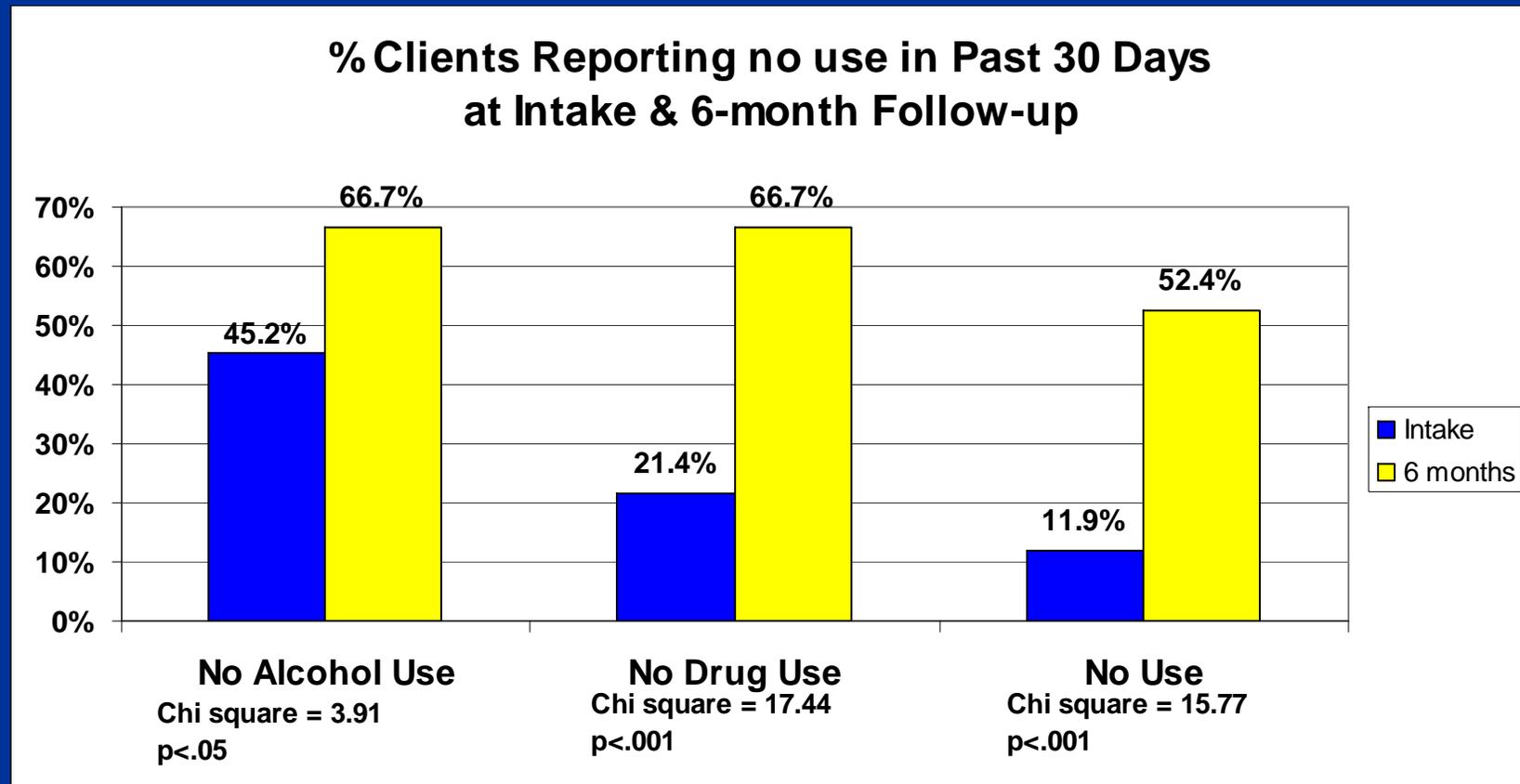


# Days Used Past 30

Drug and Alcohol use Past 30 days  
at Intake and 6-month Follow-up

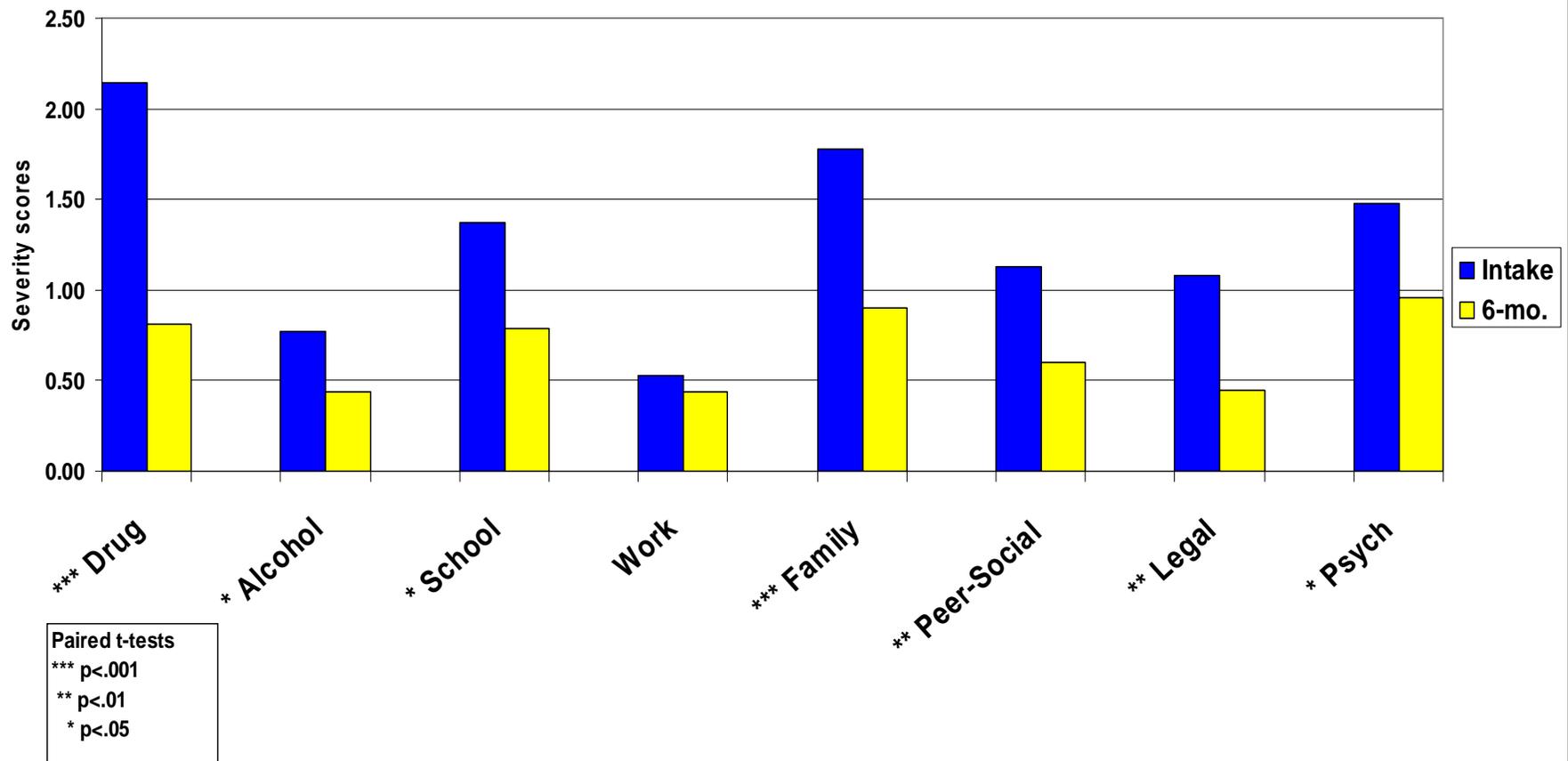


# % Reporting no Use Past 30 Days



# Teen ASI Severity Scores

Teen ASI Severity Scores at Intake and 6-month Follow-up (n=57)



Thank You!

[www.matrixinstitute.org](http://www.matrixinstitute.org)