

# Stimulants: Cocaine and Methamphetamine

CRIT program  
May 2010

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# Learning objectives

At the end of this session, participants will be able to:

1. Understand how and why people use stimulants
2. Know the characteristics of stimulant intoxication and withdrawal syndromes
3. Understand the consequences of these drugs
4. Know the current options for treatment of stimulant dependence

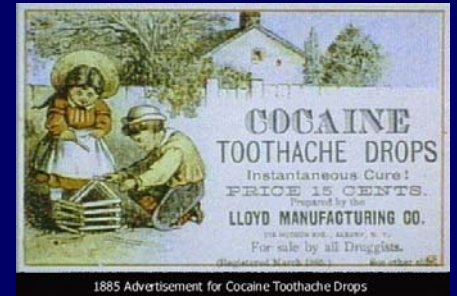
# Roadmap

1. History
2. Epidemiology
3. Dopamine and the reward pathway
4. Acute and chronic effects
5. Treatment

# History

# History: Cocaine

- From erythroxylon coca leaves in Andes
- Leaves chewed for thousands of years as stimulant
- 1884 Freud published, *Uber Coca*, describing cocaine's effects on Freud and its potential to treat opiate addiction
- 1885 Halsted published study about anesthetic uses
- 1886 Halsted raided ship medicine cabinet for fix
- Used in medicines and beverages until early 1900s
- Street preparations 10-50% cocaine
  - Hydrochloride powder is snorted or injected
  - Alkaline rocks (aka crack) are smoked
  - *Crack, Rock, Base*



# History: Methamphetamine

- 1893 methamphetamine first synthesized in Japan as decongestant.
- Used by German, English, American, and Japanese military in WWII for performance enhancement.
- First epidemic occurred in Japan when the military dumped large quantities into the civilian market
- Popular among truckers and west coast bikers in 1970s
- DESOXYN to treat ADHD and obesity
- *Speed, Crystal, Crank, Ice, Meth, Tina*



Lineberry 2006

73



...prescribe  
**Desoxyn**  
HYDROCHLORIDE  
(Methamphetamine Hydrochloride, Abbott)

**THE SYMPHONIC "AMINO" HAVE BEEN** found of value when administered under the supervision of a physician, as an adjunct to the dietary management of obesity. The chief action of these drugs in this condition is the stimulation of appetite, which is due to the effect of the drug on the central nervous system, available on the ascending limb of the medulla. In addition to moving the appetite, Desoxyn appears to be acting on the vestibular and respiratory centers and stimulates activity in such a way as to relieve the feeling of lassitude and boredom which is often the attending factor in overeating.

**SMALLER DOSE, LONGER EFFECT.** IT IS CON- siderably agreed that d-Desoxyn, although effective for stimu- lation, is somewhat more potent than amphetamine, so the stimulation desired is achieved with a smaller dose, the onset of effect is more rapid, and the duration longer. Doses exceeding these recommendations may produce side effects that attenuate the benefits of stimulation. With ordinary doses, little or no significant prompt effect has been observed.

Desoxyn should not be relied upon to induce weight reduction but should be used only under the direction of a physician in conjunction with the prescription of a general hygienic regime and a normal diet.

**DOSE, SIDE EFFECTS.—THE DOSE OF DESOXYN** must be adjusted to accordance with the requirements and response of the individual patient. When the stimulant effect of the drug is desired, an effective dosage is an average regimen. Desoxyn should be administered one-half to one- half before meals, for other purposes the timing of the drug might not be desired; in some cases Desoxyn should be administered with meals or immediately after meals.

Usually, the initial dose should be 5 to 8 mg. two to three times daily. Larger doses may be required in some cases, and should be adjusted accordingly. They may be continued as long as the desired results can be achieved and there are no untoward effects. Individual oral doses in excess of 10 mg. are likely to produce unusual central stimulation. Moderate is not recommended after a p.m. or at night, because of the possibility that the drug may interfere with sleep. If the patient is unable to sleep at night, the after- noon dose may be omitted or the stimulant stimulation counteracted by the use of sedative adjuncts such as Nembutal.

**OTHER INDICATIONS.—DEPRESSIVE STATES.** Desoxyn Hydrochloride is indicated for the symptomatic treatment of the depressed and anorectic states of mild depression, anorexia, or the maintenance of feeling of well-being and increased energy will, possibly, be produced in the patient. This means one must insure that the patient is receiving supervision for more specific therapy.

Acceptable results have also been reported following the use of d-Desoxyn Hydrochloride as an adjunct to the treatment of postoperative depression, anorexia, chronic stimulation and generally in conditions for which amphetamines are used in the form of benefit.

In some psychomotor depression, as well as in mild depressive states, d-Desoxyn Hydrochloride may be used in the management of the patient but will not affect the long-term results. The drug has been found to be useful in the treatment of apathetic states.

**INDICATIONS.—DESOXYN HYDROCHLORIDE** should be used with caution in patients with cardiovascular disease, chronic stimulation, hypertension, or in persons at advanced age. The recommended dose in patients with hypertension is 5 mg. in those who have been previously treated with epinephrine and isobutamine.

**DESOXYN PRODUCES EFFECTS SIMILAR** to those produced by amphetamine. Like the latter, it increases the heart rate, increases the rate of work, increases the efficiency and stimulates the appetite. It does not produce any marked peripheral vasoconstrictor effects of epinephrine, except in large doses.

**ONSET OF EFFECT.—ONSET OF EFFECT WITH DESOXYN** occurs in from 20 minutes to one hour. The duration of action of a single dose of 10 mg. usually varies from six to 12 hours, though in exceptional cases it may be noted for long as 24 hours. There is a marked effect following a dose of 10 to 15 mg. at intervals in some patients. By dividing the dosage, patients may usually be avoided. The feeling of well-being, the effect of the drug, (intensity of stimulation) is somewhat greater in normal than in depressed or stimulant states.


**BLOOD PRESSURE, PULSE RATE AND RESPIRATORY** rate usually are only slightly or temporarily affected, unless doses exceeding 10 to 15 mg. daily are taken.

**THE PARENTERAL ADMINISTRATION OF DESOXYN** Hydrochloride is suggested for relieving and maintaining blood pressure during operative procedures, particularly during spinal or regional block anesthesia. Its use is suggested for control of some hypertension during surgical operations and for preoperative administration, particularly before spinal anesthesia, to patients who manifest hypertension or who are considered poor surgical risks.

**TOLERANCE NOT DEVELOPED, WHILE THE DRUG** is not habit forming in the true sense of the word, some tolerance may develop to its effect on the stimulation, or normal subjects may be induced to use it in excess for relief of fatigue. Tolerance to the drug is not developed. The response and making effects decrease with prolonged use of the drug in excess of the recommended dose for sleep and rest. As a result, a larger dose is required to reach the desired effect for sleep, and it is the more that the pro- perties of the substance diminish and the more effects. Withdrawal of the drug may then be rendered impossible. Administration of Desoxyn should be under the constant supervision of a physician.

1957

81



he doesn't  
blow his top...

**WEIGHT  
REDUCTION  
WITHOUT  
JITTERS**


**AMBAR<sup>TM</sup> TABLETS AND EXTENTABS<sup>®</sup>**

**Weight Reduction:** These patients may resist weight reduction because they fear losing the emotional security involved in overeating. Ambar Extentabs or Tablets help them hold the diet line by giving them a more alert, brighter outlook. Ambar adds incentive to weight reduction, gives the patient a better chance of holding off the disabling effects of continued overweight.

**Without Jitters:** Methamphetamine, a more potent CNS stimulant than amphetamine, but producing less cardiovascular effect, is combined in Ambar with phenobarbital. The combination subdues CNS effects just enough to protect the patient from overstimulation. Result: mood enhancement with no undesirable excitation—weight reduction without jitters.

**Ambar Extentabs:** 10 to 12 hours of appetite suppression in one contracted release, no second action. Tablets.  
Methamphetamine Hydrochloride . . . 20.0 mg.  
Phenobarbital 13 gr. . . . . 84.8 mg.  
**Ambar Tablets:** for conventional dosage or sublingual therapy.  
Methamphetamine Hydrochloride . . . 25.0 mg.  
Phenobarbital 16 gr. . . . . 21.6 mg.

**A. H. ROBINSON CO., INC.**  
Riverside 35, Virginia  
Clinical Pharmacologists  
of New York 1979



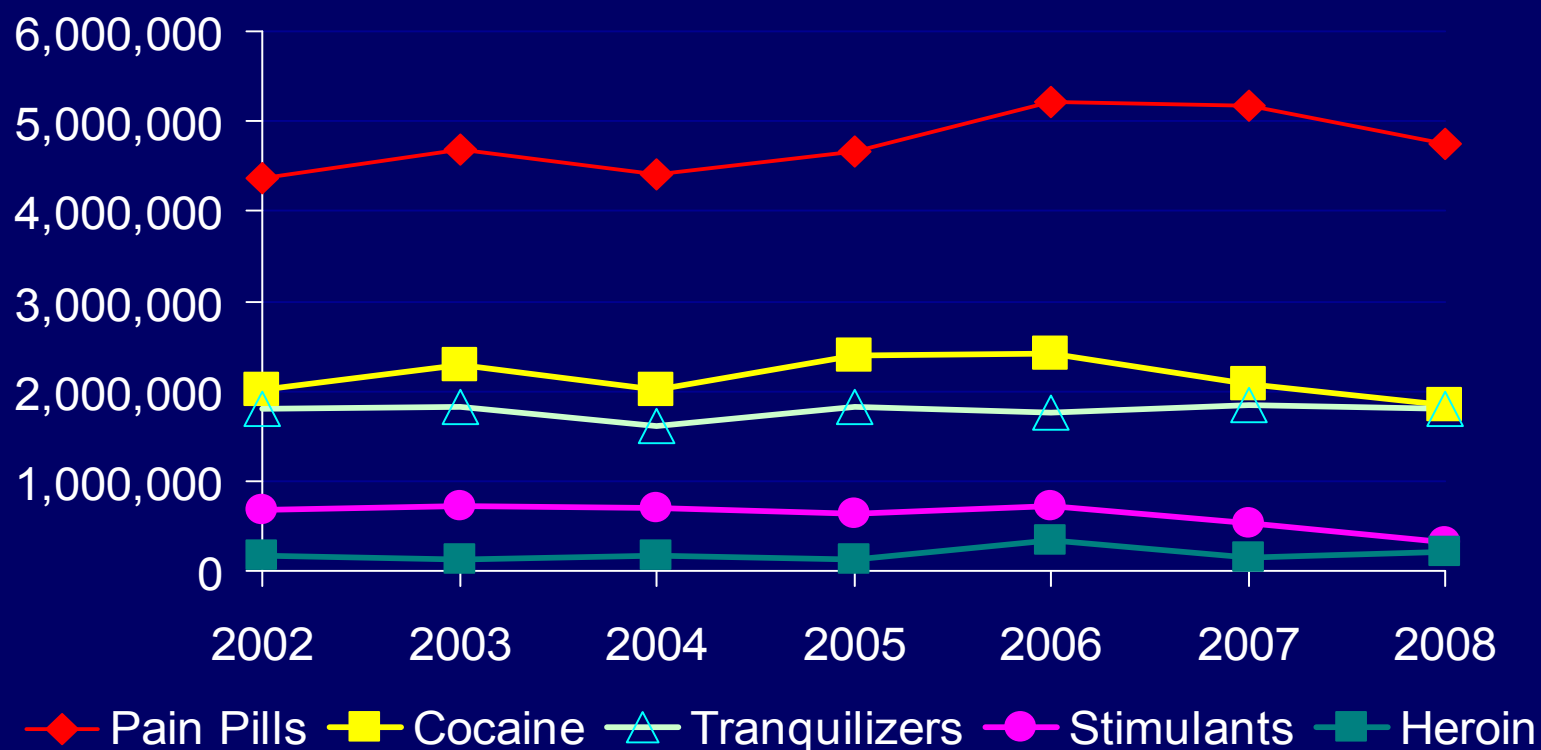
1959

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# Epidemiology



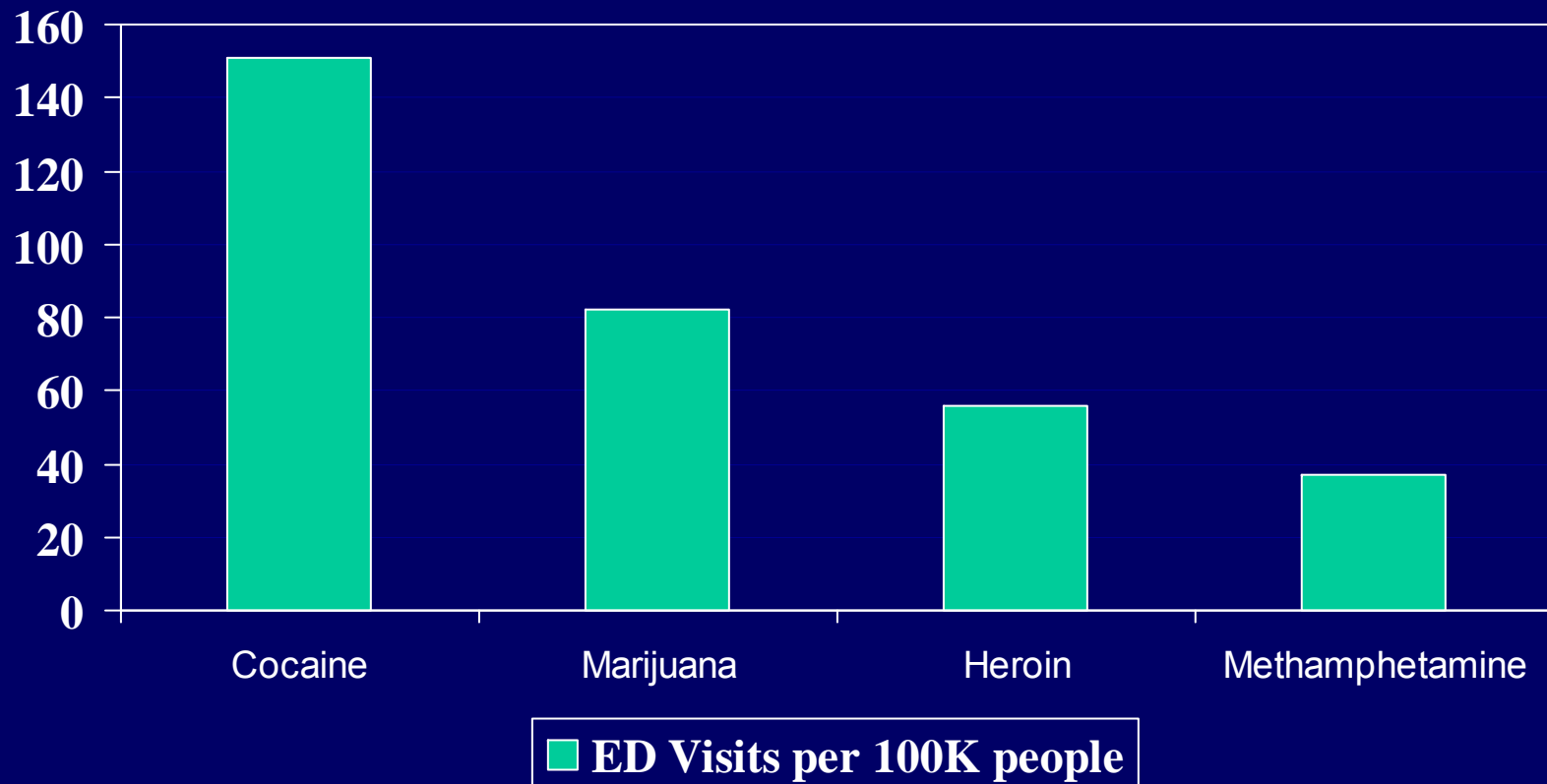
# Past Month Use: 2002-2008



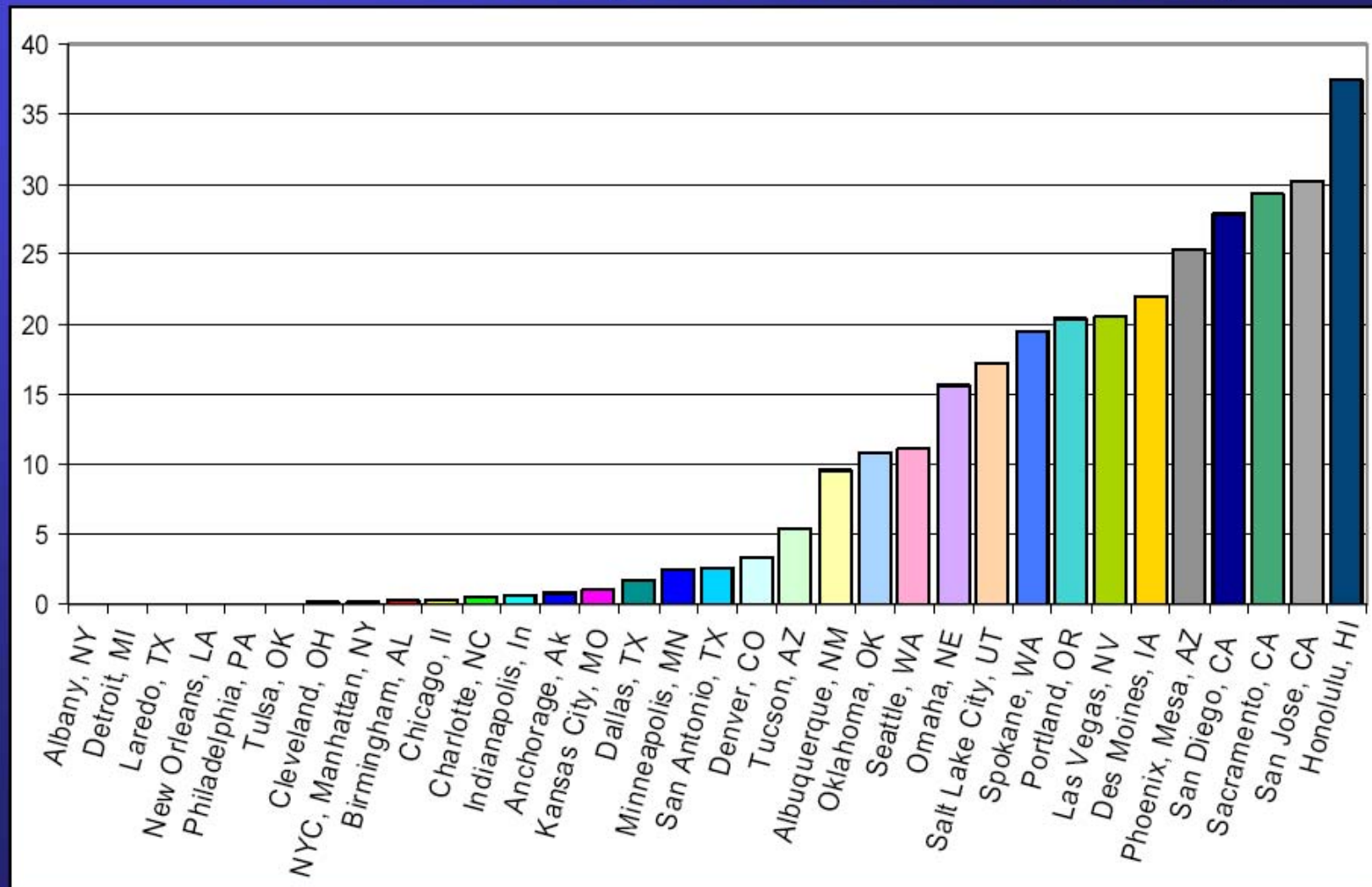
NSDUH 2008

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# 2005 drug-related ED visits



## Percent Male Arrestees Testing Positive for Meth (for 33 ADAM sites, 2001)



# From where do these drugs come?

- Methamphetamine
  - Super labs – Primarily Mexico and California
  - Local clandestine labs - 1 pound of MA creates 6 pounds of toxic waste
    - Holton WC. Unlawful lab leftovers. *Environ Health Perspect.* 2001;109:A576
- Cocaine -
  - 75% grown in Columbia with 75% via Mexico/ Central America

# Cocaine processing

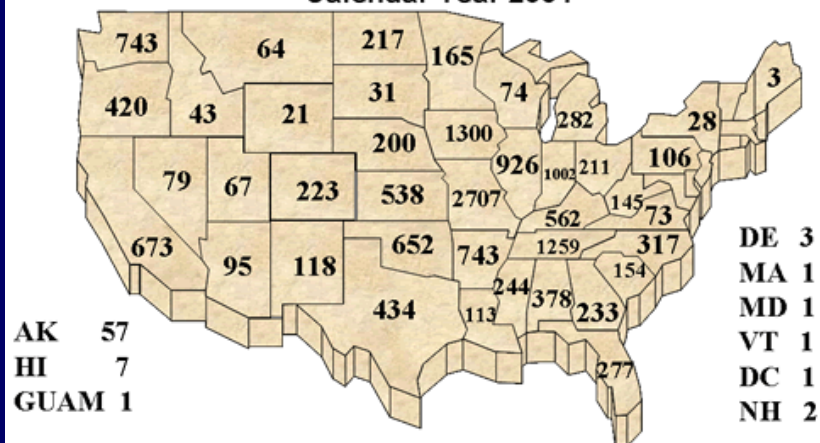


<http://www.colombiajournal.org/cocainephotos.htm>

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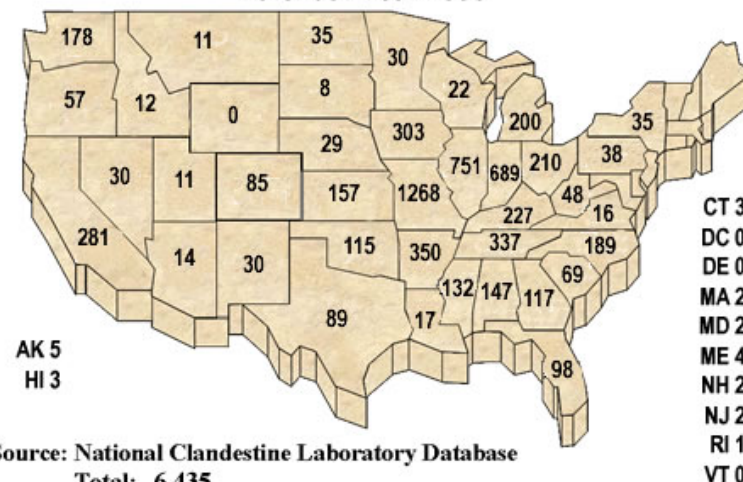
# Clandestine lab incidents

Total of All Meth Clandestine Laboratory Incidents  
Including Labs, Dumpsites, Chem/Glass/Equipment  
Calendar Year 2004



Source: National Clandestine Laboratory Database  
Total: 15,994 / 49 States Reporting  
Dates: 01/01/04 to 12/31/04

Total of All Meth Clandestine Laboratory Incidents  
Including Labs, Dumpsites, Chem/Glass/Equipment  
Calendar Year 2006



Source: National Clandestine Laboratory Database  
Total: 6,435

Dates: 01/01/2006 - 12/31/2006

Map last updated February 2007

# Stimulant Effects

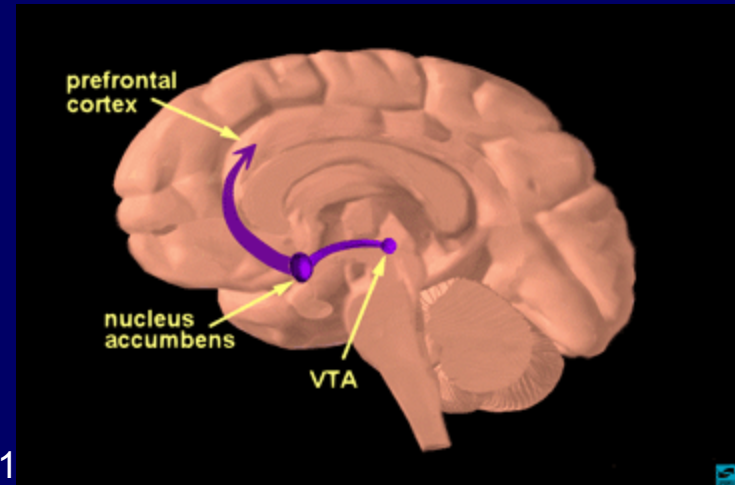
# Why do people use drugs?

1. To feel good
2. To feel better

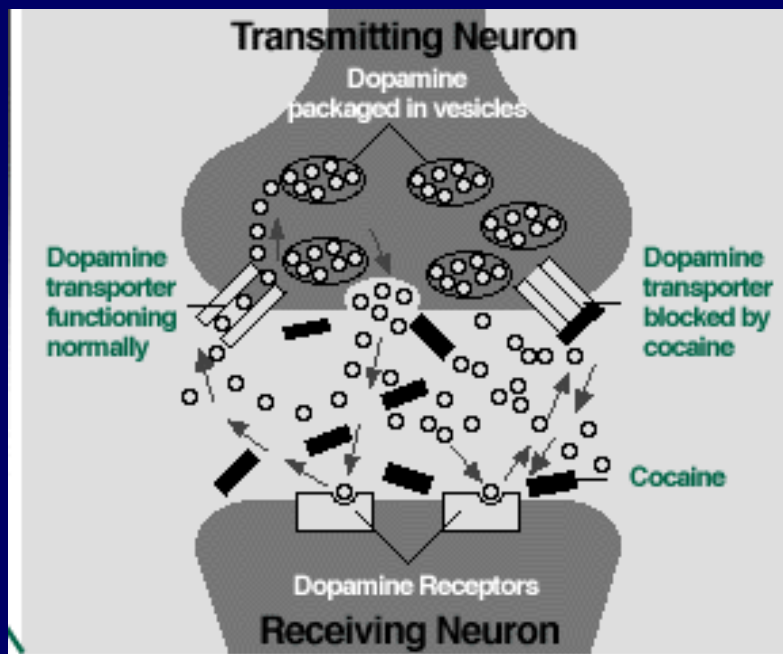


# Why do people use stimulants?

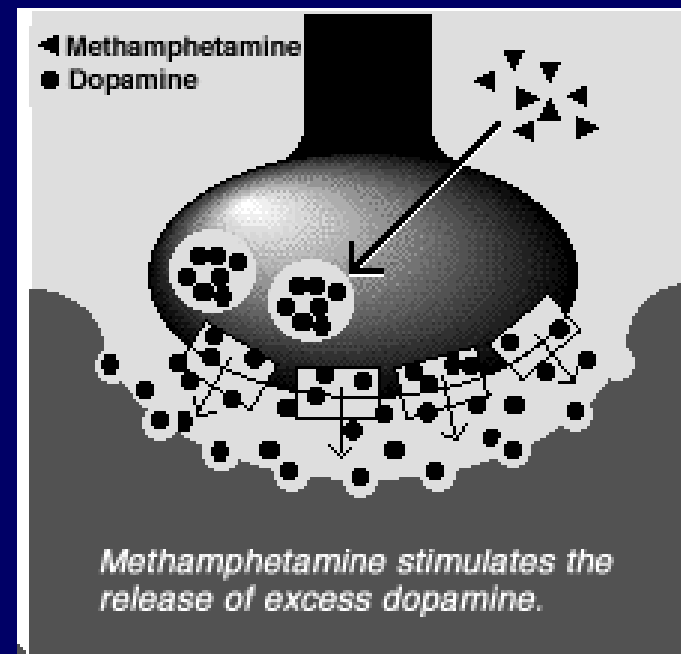
- Euphoria - Rush
  - Onset and intensity depends on delivery method
- Increased energy, alertness, libido
- Diminished social inhibition
- Decreased appetite



# Cocaine



# Methamphetamine



# PK: Cocaine

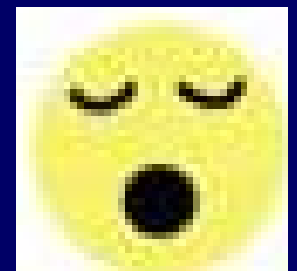
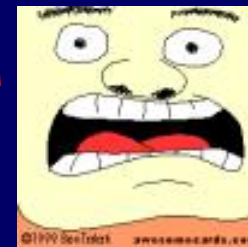
	IV	Smoked	Snorted
Time to effect	10-60sec	3-5sec	1-5min
Peak concent.	3-5min	1-3min	15-20min
Half-life	20-60min	5-15min	60-90min

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Lange, R. A. and L. D. Hillis (2001). "Cardiovascular complications of cocaine use." N Engl J Med **345**(5): 351-8.

# PK: Methamphetamine

	IV	Smoked	Snorted	Ingested
Time to effect	15-30 sec	Immediate	3-5 min	15-20 min
Peak concent.	2-4 h	2-4 h	2-4 h	2-4 h
Half-life	10-12 h	10-12 h	10-12 h	10-12 h



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# Binges

- 2-3 day binges are typical, called runs
- Regular redosing to maintain rush or high in setting of acute tolerance
- Ends when drug or money runs out, or paranoia/ disorganized thinking sets in



# Acute Toxicity



- Elevated BP and HR
- Arrhythmia
- Vasoconstriction
- Hyperthermia
- Acute psychosis → prolonged psychosis
  - Paranoid delusions
  - Visual, sensory, and auditory hallucinations (ie formications)
- Agitation
- Rhabdomyolysis
- Seizure

# Intoxication Treatment

- Minimize sensory stimulation
- Neuroleptics (ie haldol) for agitation
- Benzos to control seizures
- Treat hyperthermia (external cooling)
- For increased BP+HR, use vasodilators and CCB or non-selective beta-blockers

# Withdrawal dopamine depletion

- Intense craving
- Depression
- Fatigue
- Unpleasant dreams
- Hypersomnia, then insomnia
- Increased appetite
- Agitation/ anxiety/ paranoia
- Limited ability to experience pleasure



# Health Consequences

### **Dental**

- Darkened teeth
- Caries
- Periodontal disease

### **Pulmonary**

- Acute pulmonary edema
- Pulmonary HTN
- Inhalation injury

### **Cardiovascular**

- Hypertension
- DCM
- Arrhythmia/ Tachycardia
- Acute Coronary Syndrome
- Aneurysm/ dissection
- Erectile dysfunction

### **Infectious**

- HIV risk
- HCV/ HBV
- STDs



### **Neuro-psychiatric**

- Stroke
- Seizure
- Depression
- Anxiety
- Mania
- Impulsivity
- Paranoia
- Auditory/ visual hallucinations + formications
- Violence

### **Renal/Metabolic**

- Rhabdomyolysis
- Dehydration
- Acute Renal Failure
- Acidosis
- Hyperthermia

### **Skin**

- Cellulitis/ abscess
- Excoriations
- Chemical burns

# Cocaine and heroin

- 30-80% of heroin users use cocaine
- Cocaine use results in more injections
- Cocaine worsens opiate treatment success
- For 50% of co-users, MMT reduces cocaine

Leri F. Addiction 2003: 98, 7-22.

# Cocaethylene

- Psychoactive substrate from EtOH+cocaine
- ETOH commonly used to “come down”
- EtOH before cocaine inhibits cocaine metabolism, producing cocaethylene
- 60-90% of cocaine abusers abuse ETOH
- Greater cardiac toxicity
- Greater rates of seizures, hepatic damage

# Treatment

# Pharmacologic Treatment

- Antipsychotics
  - – Amato. Cochr Database Syst Rev. 2007 Jul 18;(3):
- Anticonvulsants - GABA modulators
  - Carbamazepine, Phenytoin, Valproic Acid, Tigabine, Gabapentin, Lamotrigine – Alvarez. JSAT 2010: 38; 66-73.
  - Baclofen – Heinzerling. Drug Alcohol Depend. 2006 Dec 1;85(3):177-84.
  - Vigabatrin (GVG) – Brodie. Am J Psychiatry. 2009;166:1269-77.
- Stimulant replacement
  - Modafinil – Shearer. Addiction. 2009 Feb;104(2):224-33.
  - Dexamphetamine – Longo. Addiction 2009, 105, 146–154
- Vaccine
  - Martell. Arch Gen Psychiatry. 2009 Oct;66(10):1116-23.
- Disulfiram – Pani. Cochr Database Syst Rev. 2010 Jan 20;(1):

# Non-Pharma Treatment

- Brief Intervention?
  - Bernstein et al. DAD 2005; 77: 49.
- Cognitive behavioral therapy
- Self-help/ 12 step groups
- Residential Treatment
- Contingency management

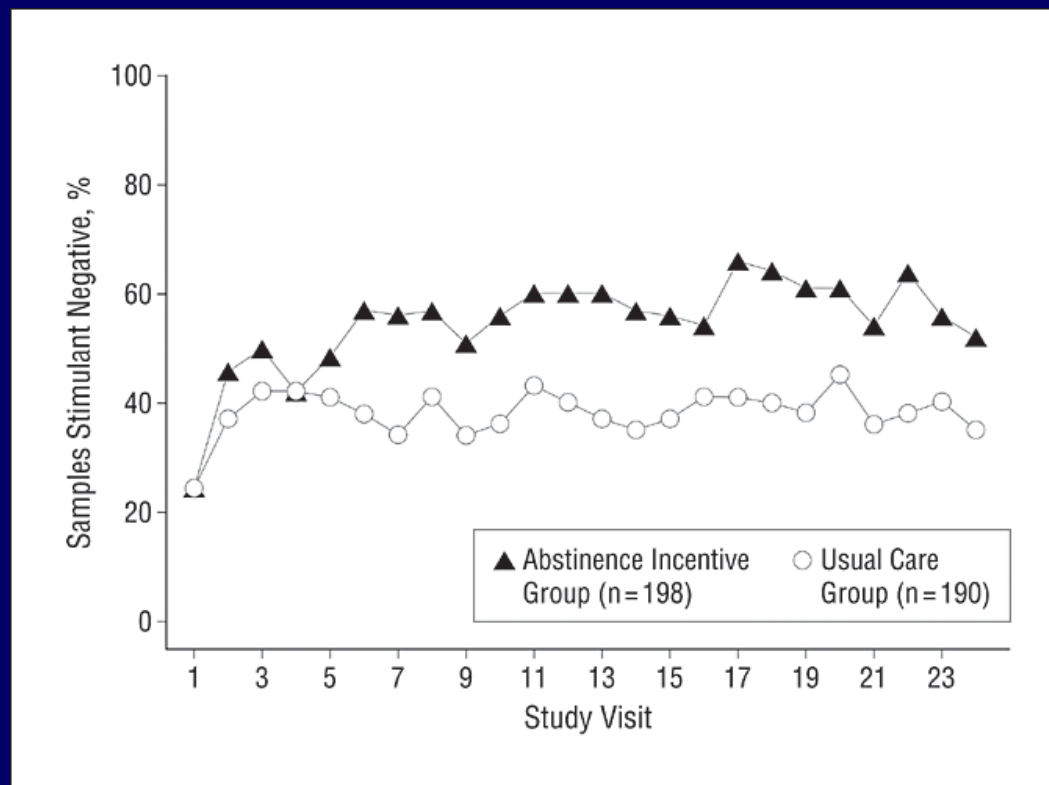
# Contingency Management

RCT in 6 community methadone programs of CM among stimulant users

- Usual Care vs.
- Intermittent, escalating re-enforcement
  - 1000 chips
    - 500 “Good job”
    - 250 “Small” - \$1 value – i.e. toiletries
    - 209 “Large” - \$20 value – i.e. kitchenware
    - 1 “Jumbo” – \$80-100 value – tv, stereo
  - # of draws = # of weeks with clean urine



# Contingency Management



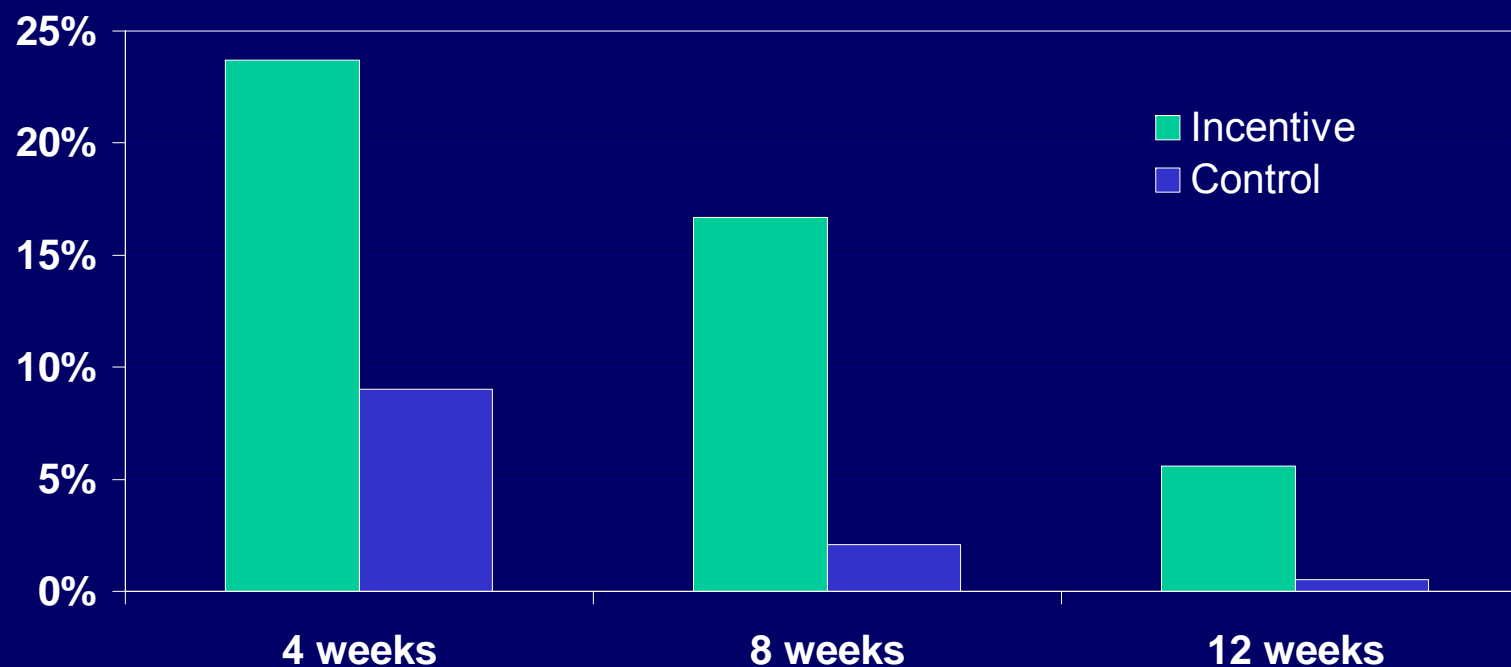
The mean percentage of submitted samples testing negative for target drugs (stimulants and alcohol) is shown for abstinence incentive and usual care participants at each of 24 study visits.

Peirce et al. Arch Gen Psychiatry. 2006;63:201-208

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# Contingency Management

Methadone Maintenance Patients With Specified Weeks of Continuous Stimulant/Alcohol-Negative Samples (n=388)



Average cost = \$1.46 per person/day

Pierce et al. Arch Gen Psychiatry. 2006;63:201-208.  
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# Cognitive Behavioral Therapy

16 week RCT of cocaine-dependent  
methadone patients of:

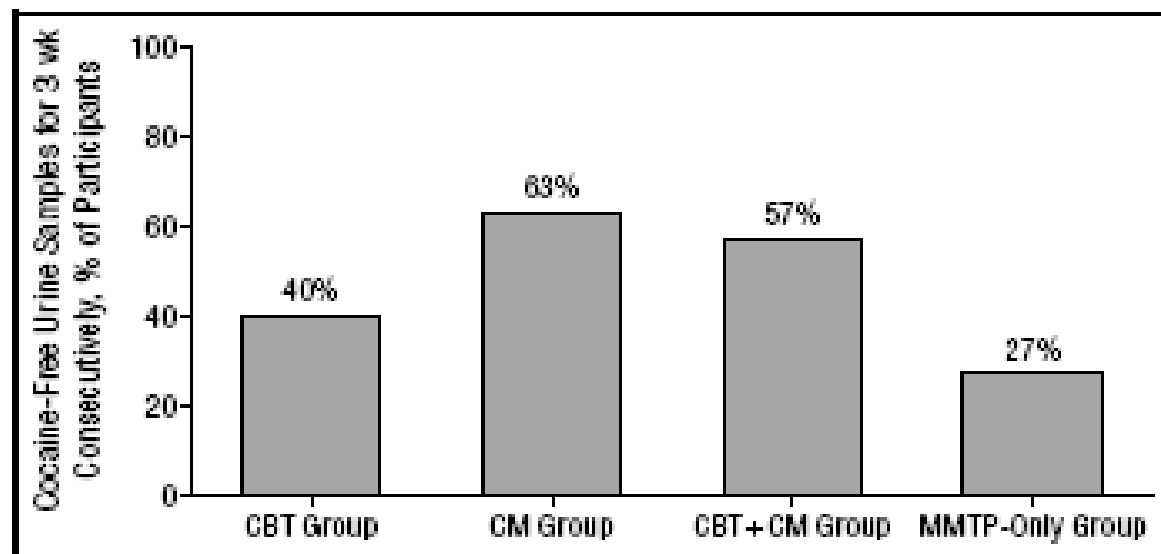
CBT vs. CM vs. CBT+CM vs. TAU

30 patients per group

Rawson et al. Arch Gen Psychiatry. 2002

CRIT Program 2010

# Cognitive Behavioral Therapy

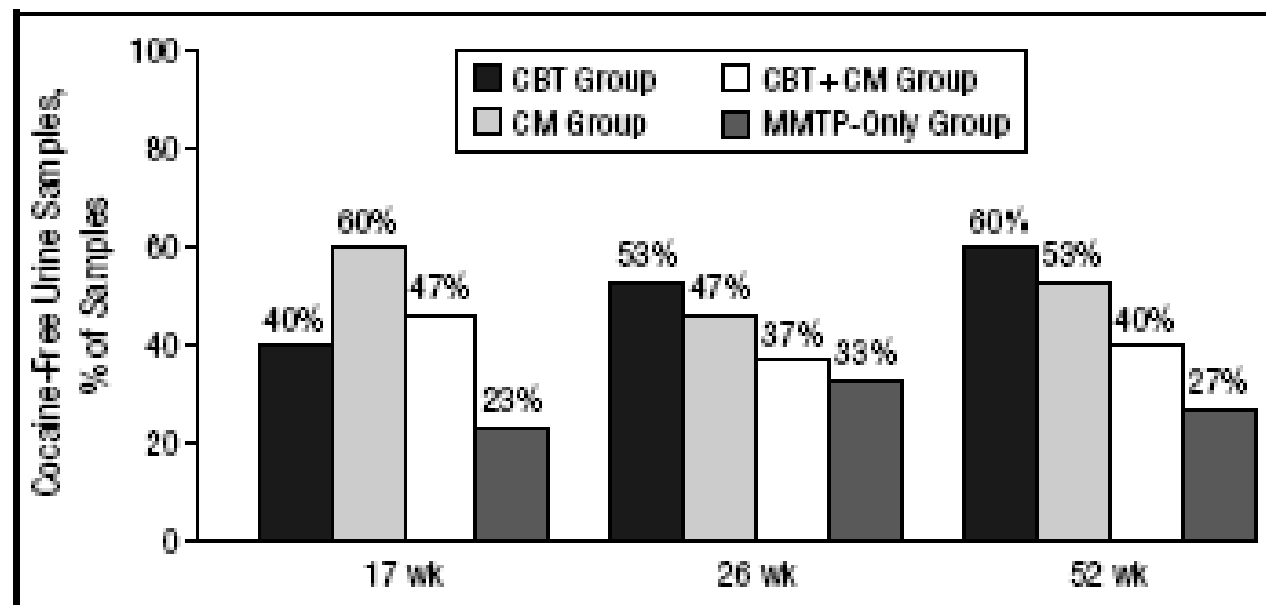


**Figure 5.** Percentage of patients achieving 3 consecutive weeks of cocaine-free urine samples by group ( $\chi^2_3=9.9$ ;  $P=.02$ ). CBT indicates cognitive-behavioral therapy; CM, contingency management; and MMTP, methadone maintenance treatment program.

Rawson et al. Arch Gen Psychiatry. 2002

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# Cognitive Behavioral Therapy



**Figure 6.** Percentage of 30 possible cocaine-free urine samples at the 17-week, 26-week, and 52-week follow-up points. CBT indicates cognitive-behavioral therapy; CM, contingency management; and MMTP, methadone maintenance treatment program.

# 5 things about stimulants

1. Easily available
2. Directly activate the mesolimbic pleasure center
3. Binge use often ends with dysphoria or lack of funds
4. Social and medical consequences
5. Treatment can work if you can find it

# Learning objectives

At the end of this session, participants will be able to:

1. Understand how and why people use stimulants
2. Know the characteristics of stimulant intoxication and withdrawal syndromes
3. Understand the consequences of these drugs
4. Know the current options for treatment of stimulant dependence

# Thanks!

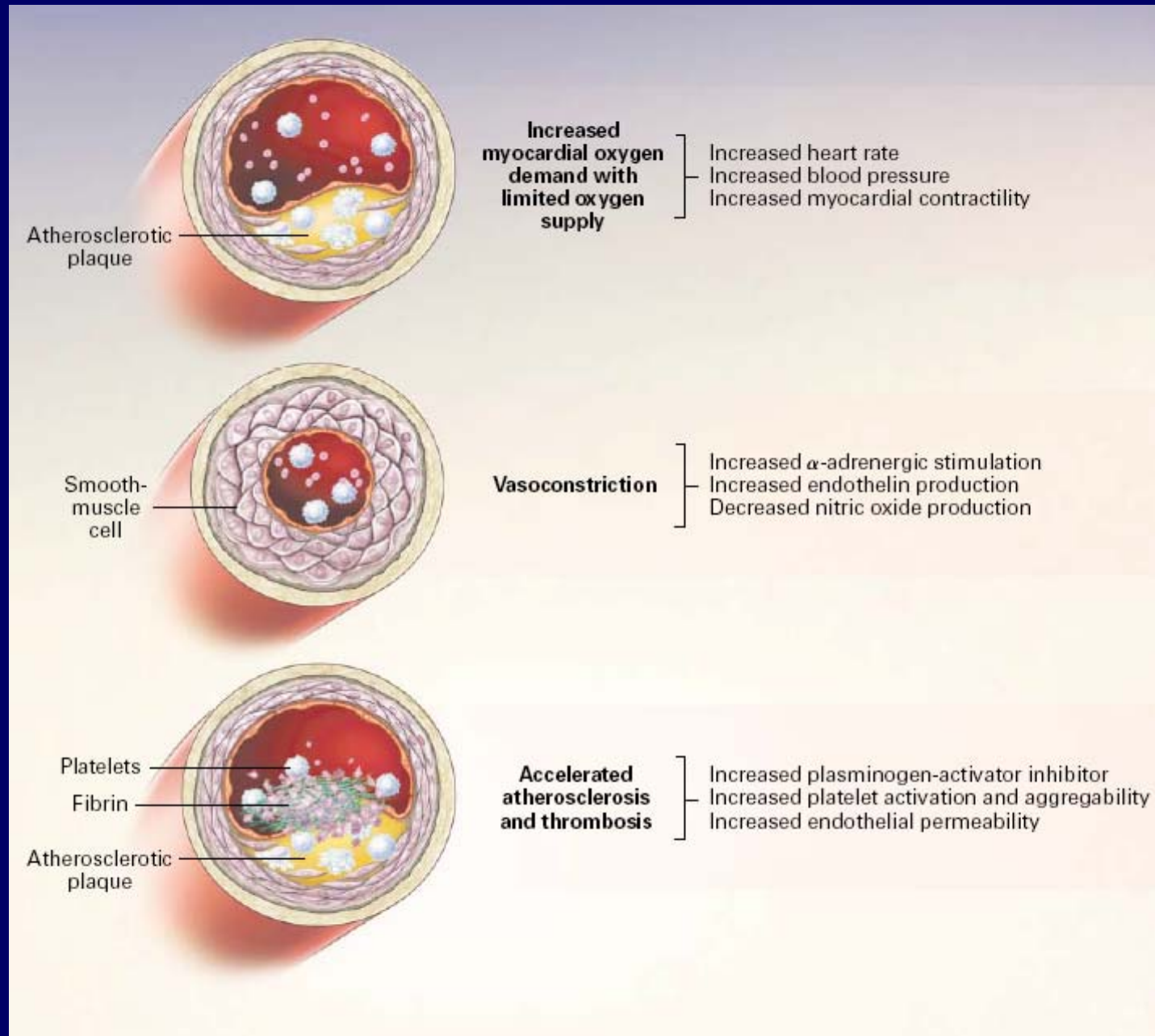
Alex Walley, MD, MSc  
awalley@bu.edu



# Pharmacologic Treatment

- Pharmacologic treatments studied
  - Dopamine agonists
  - Antidepressants
  - Opioid partial agonists and antagonist
  - Carbamazepine, phenytoin, lithium
- None proven effective

De Lima MS. Addiction. 2001; 97, 931-949.



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Lange, R. A. and L. D. Hillis (2001). "Cardiovascular complications of cocaine use." N Engl J Med **345**(5): 351-8.

# 2007 ACC/AHA guidelines UA/ NSTEMI in cocaine and methamphetamine

- Class I: Benefit >>> Risk
  - For STE or STD: NTG and CCB
  - For persistent STE: Cath with PCI or lytics
- Class IIa: Benefit > Risk
  - Chest pain w/o ST changes: NTG and CCBs
  - STD or new TW changes: Cath
- Class IIb: Benefit  $\geq$  Risk
  - Increased HR or BP: Mixed alpha/beta blocker after vasodilator
- Class III: Risk  $\geq$  Benefit
  - No ST changes: Cath

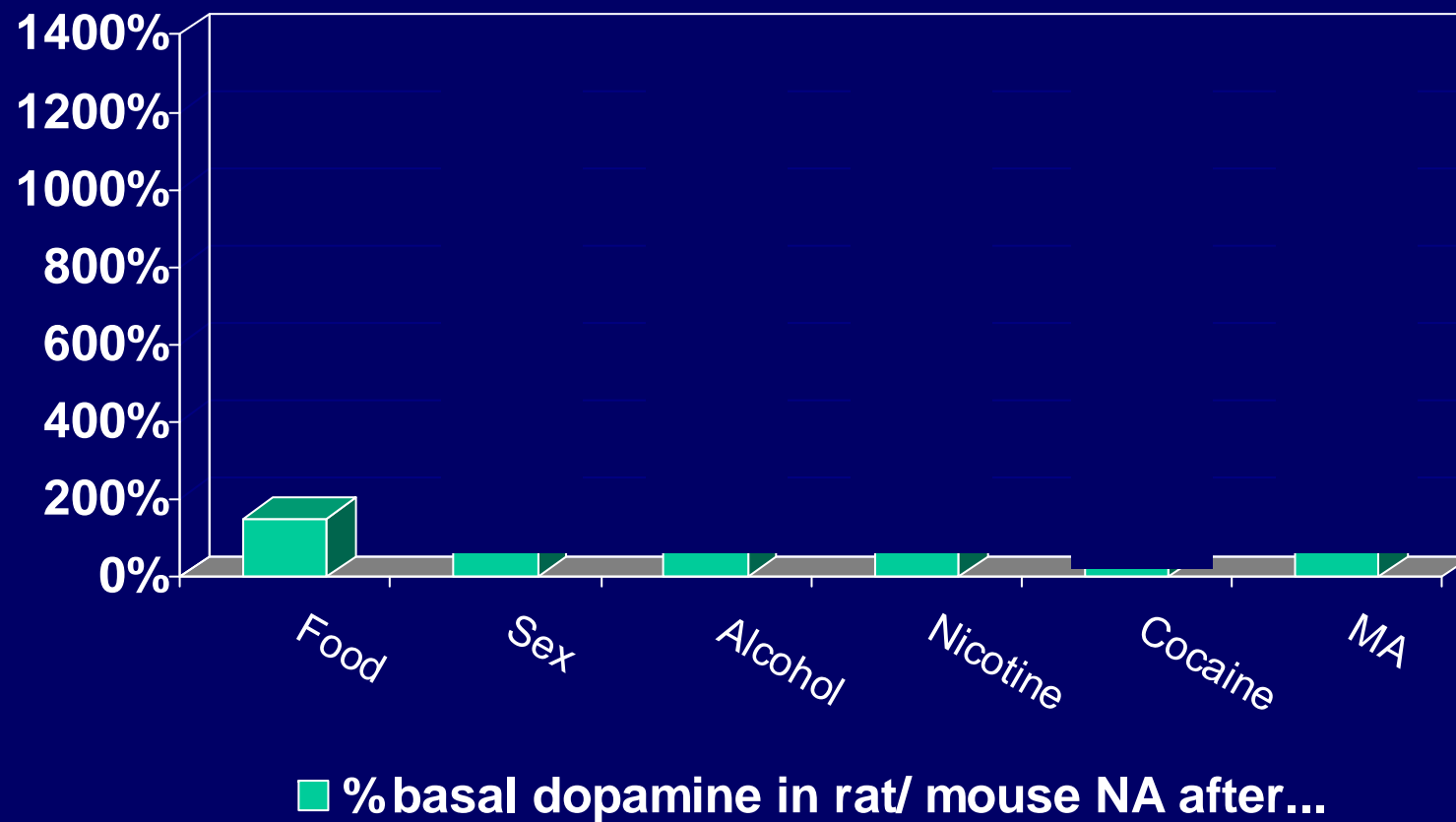
Note: Level of evidence is C “expert opinion” for all recommendations

# AHA 2008 Scientific Statement on cocaine chest pain and MI

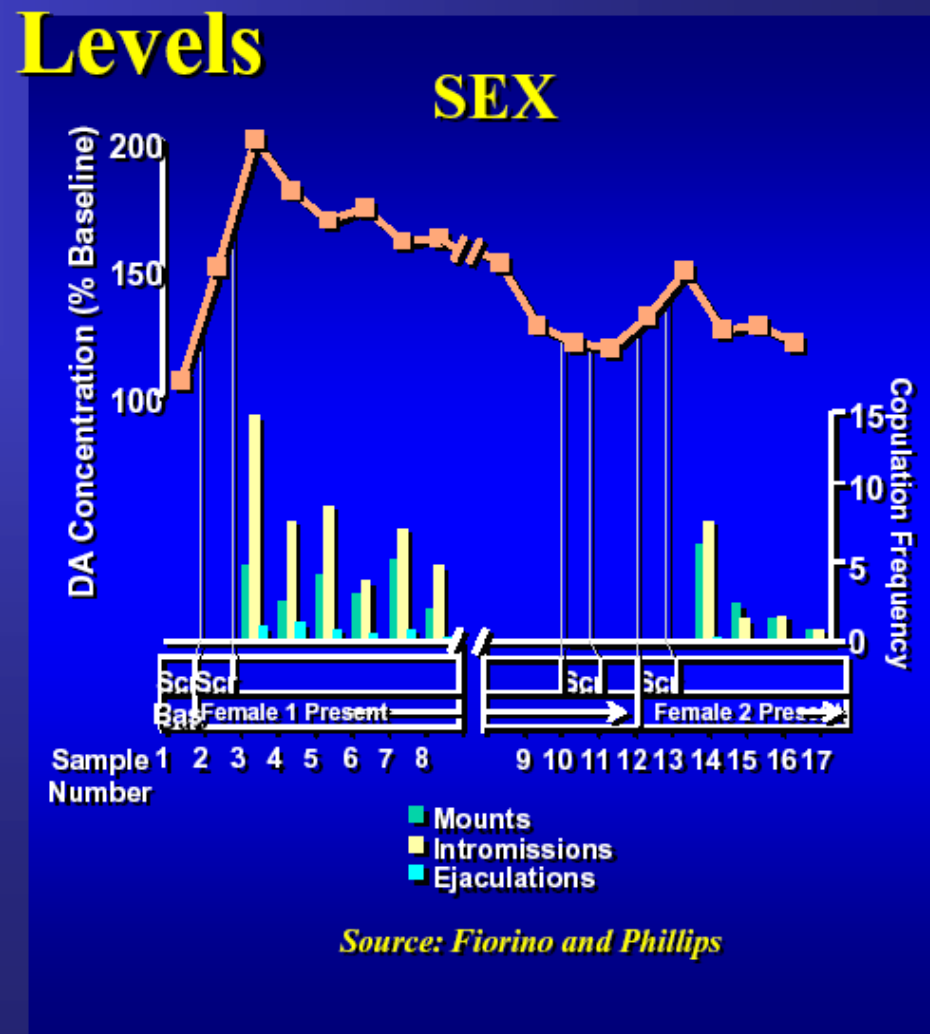
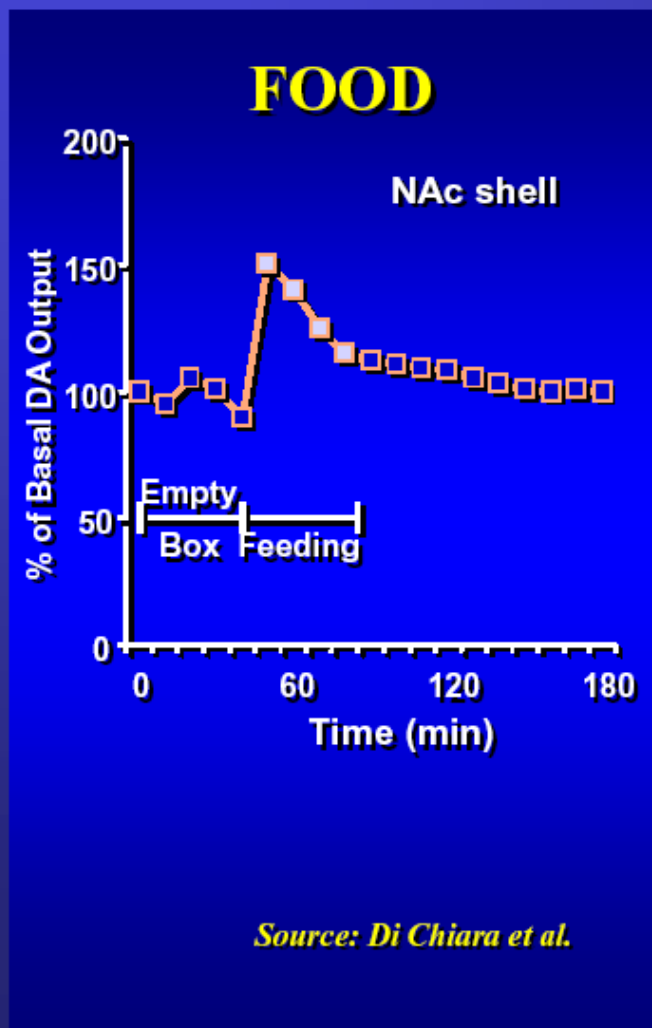
- Class I: Benefit >>> Risk
  - Benzodiazepines (Level B)
  - ASA (Level C)
  - NTG (Level B)
- Class IIb: Benefit  $\geq$  Risk
  - CCB (Level C)
  - Phentolamine (Level C)
- Class III: Risk  $\geq$  Benefit
  - Beta-blockers (Level C)

McCord et al. Circulation. 2008; 117.

# Dopamine release: nucleus accumbens



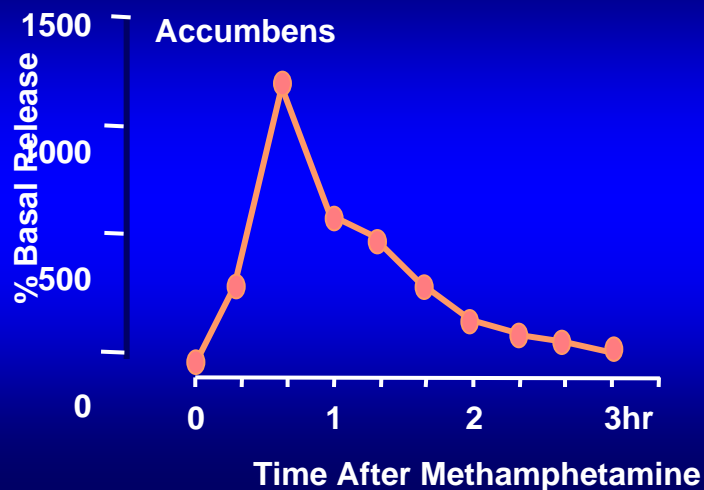
# Natural Rewards Elevate Dopamine



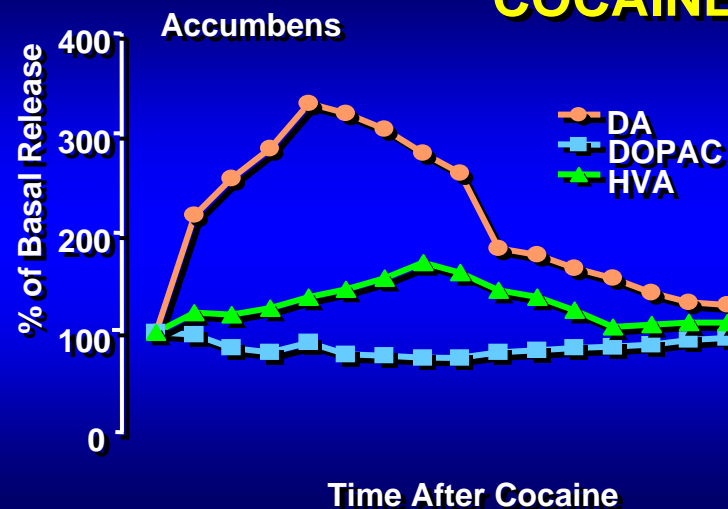
Slide from Richard Rawson

# Effects of Drugs on Dopamine Release

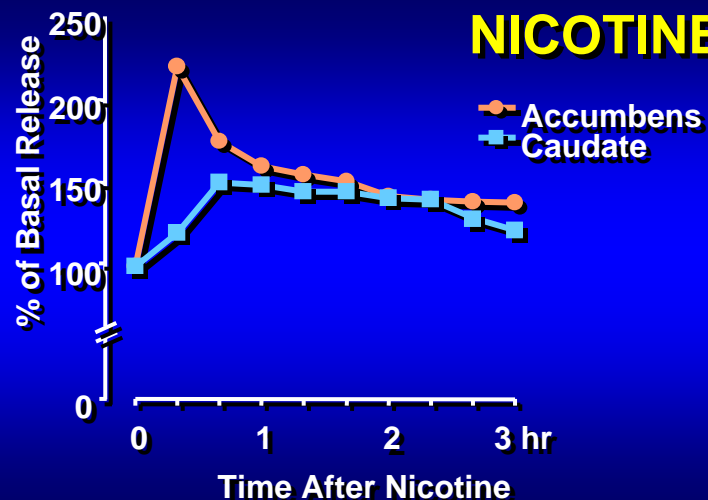
## METHAMPHETAMINE



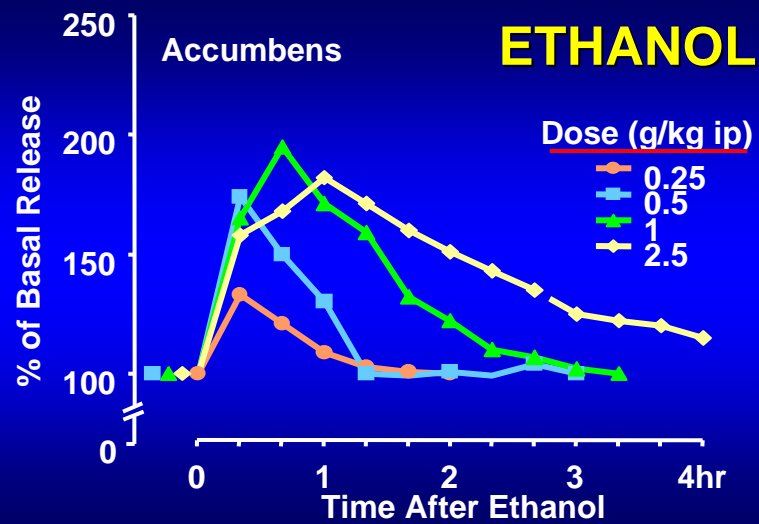
## COCAINE



## NICOTINE



## ETHANOL



**According to the Drug Enforcement Agency (DEA), crystal methamphetamine (meth) is the number one drug in rural America. And now, the crystal meth epidemic is spreading like wildfire in cities and suburbs across America. Crystal meth has become the new drug of choice for everyone from soccer moms to working moms. Even grade school students are being caught in its deadly grip.**

**Meth is cheap and easy to make. The recipe includes over-the-counter cold medicine, household cleaners and toxic chemicals like battery acid. This drug crisis has forced many store owners to put cold remedies under lock and key. Thousands of homemade meth labs are popping up in kitchens, garages, even inside cars. In one Iowa town officials were forced to ban children from bringing baked goods to school because so many parents are cooking meth with the same utensils.**

**It's cheap, instantly addictive, often deadly—and it's probably already in your neighborhood.**



*Will She Choose Life or Death?*  
**An Oprah Winfrey Show Intervention**  
May 13, 2005

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Chantel looks like an all-American 17-year-old girl. Her mother is a teacher's assistant and her father sells insurance. She works at an espresso shop. But she's addicted to crystal meth. Chantel and her family live outside Granite Falls, Washington.



She says she's been addicted to meth for a year and a half, after being introduced by friends, and she says she was instantly hooked from the very first hit.

Since that time, she says the longest she's gone without using meth was 40 days. In that time, Chantel says, "I was having a ball. I was going to church to see if that was the way for me. I was having fun, hanging out with sober people. And then it was just in front of me one night and I did it and I was hooked again."

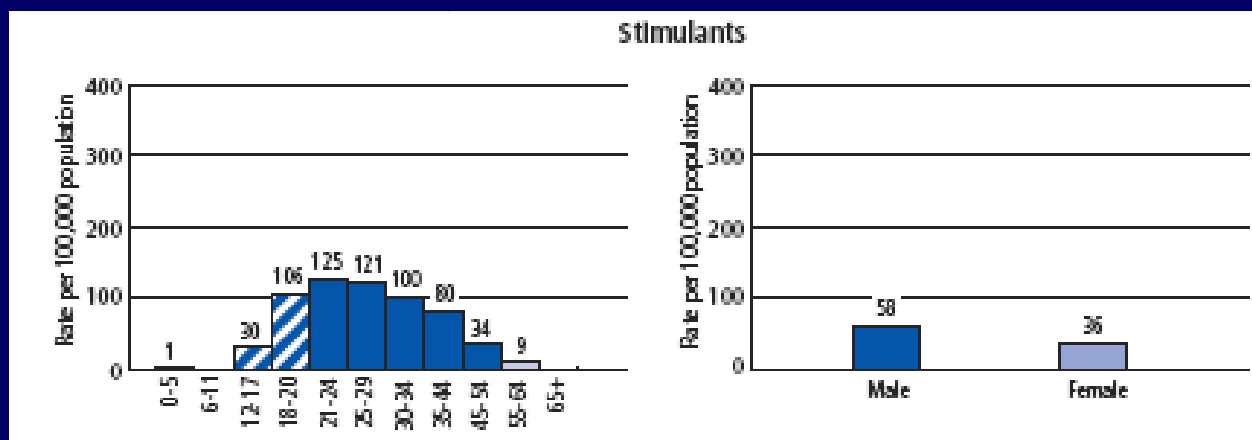
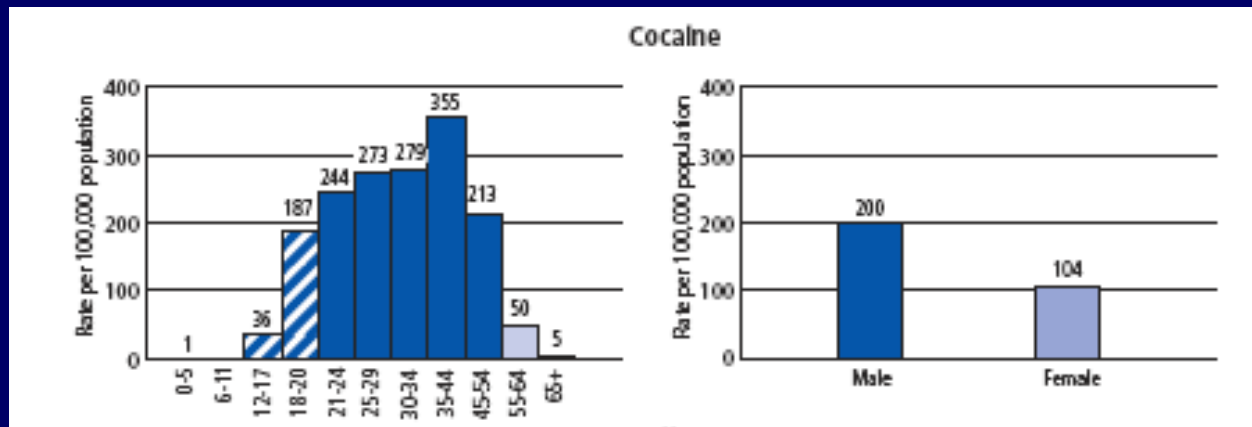
On one occasion, Chantel says she stayed up for 13 straight days, getting high every 20 minutes. "Meth makes you have this burst of energy," she explains. "And if you keep smoking it, you'll keep that energy burst." Was she worried about overdosing during that two-week binge? "You don't worry about anything," Chantel says. "You don't have any thought in your mind besides, 'Let's hit it again.'"

# Pregnancy

- More common in stimulant users:
  - Mental illness, seizure, injury, hypertension
  - Premature membrane rupture and labor, placenta previa, placental abruption, intrauterine death
- 1998-2004
  - Cocaine-related hosp decreased: 0.74>>0.41 per 100
  - MA-related hosp increased: 0.11>>0.22 per 100
- Cocaine vs. MA related pregnancy
  - More common for cocaine: mental illness, poor fetal growth, and premature delivery
  - More common for MA: hypertension, placenta previa

Cox et al. Obstet Gynecol. 2008;111:341-7.

# 2005 drug-related ED visits



Drug Abuse Warning Network 2005 Report

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# Cardiomyopathy and Methamphetamine

- In a case-control study, researchers examined the association between methamphetamine use and cardiomyopathy (CM).
- Subjects included patients aged 45 years or younger discharged from a tertiary care medical center in Honolulu.
- Through medical record review, researchers identified...
  - 107 cases (had a discharge diagnosis of CM or congestive heart failure) and
  - 114 controls (ejection fraction  $\geq 55\%$  and no wall motion abnormalities).

Yeo K-K, et al. *Am J Med.* 2007;120(2):165–171.

# Cardiomyopathy and Methamphetamine

- 42% of cases and 20% of controls had ever used methamphetamine.
- Methamphetamine use was significantly more common in cases than in controls.
- OR in analyses adjusted for age, body mass index, and renal failure, 3.7

Yeo K-K, et al. *Am J Med.* 2007;120(2):165–171.

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**“No lies here folks this recipe will manufacture methamphetamine this will get you into trouble if you do this BE CAREFUL!”**

**First of all let's talk about supplies:**

- 1 Case Regular Pint size Mason Jars ( Used for canning)
- 2 Boxes Contact 12 hour time released tablets.
- 3 Bottles of Heet.
- 4 feet of surgical tubing.
- 1 Bottle of Rubbing Alcohol.
- 1 Gallon Muriatic Acid ( Used for cleaning concrete)
- 1 Gallon of Coleman's Fuel
- 1 Gallon of Aceton
- 1 Pack of Coffee Filters
- 1 Electric Skillet
- 4 Bottles Iodine Tincture 2%
- 2 Bottles of Hydrogen peroxide
- 3 20 Oz Coke Bottles (Plastic type)(with Lids/caps)
- 1 Can Red Devils Lye
- 1 Pair of sharp scissors
- 4 Boxes Book Matches (try to get the ones with brown/red striker pads)
- 1 pyrodex baking dish
- 1 Box execto razor blades single sided
- 1 digital scale that reads grams
- 2 gallons distilled water
- 1 Roll Aluminum foil tape

**“That's what you would have to go buy if you wanted to make meth.”**

# Treating Methamphetamine Dependence Reduces Risk for HIV

Rawson RA, et al. *J Subst Abuse Treat.* 2008;35(3):279–284.  
Summary by David A. Fiellin, MD

# Objectives/Methods

- 787 methamphetamine- dependent individuals who received 1 of 2 counseling strategies:
  - 16 weeks of a standardized psychosocial protocol (Matrix Model), or
  - 8–16 weeks of treatment-as-usual representing 8 diverse treatment approaches
- Both approaches focused on drug use, not HIV risk



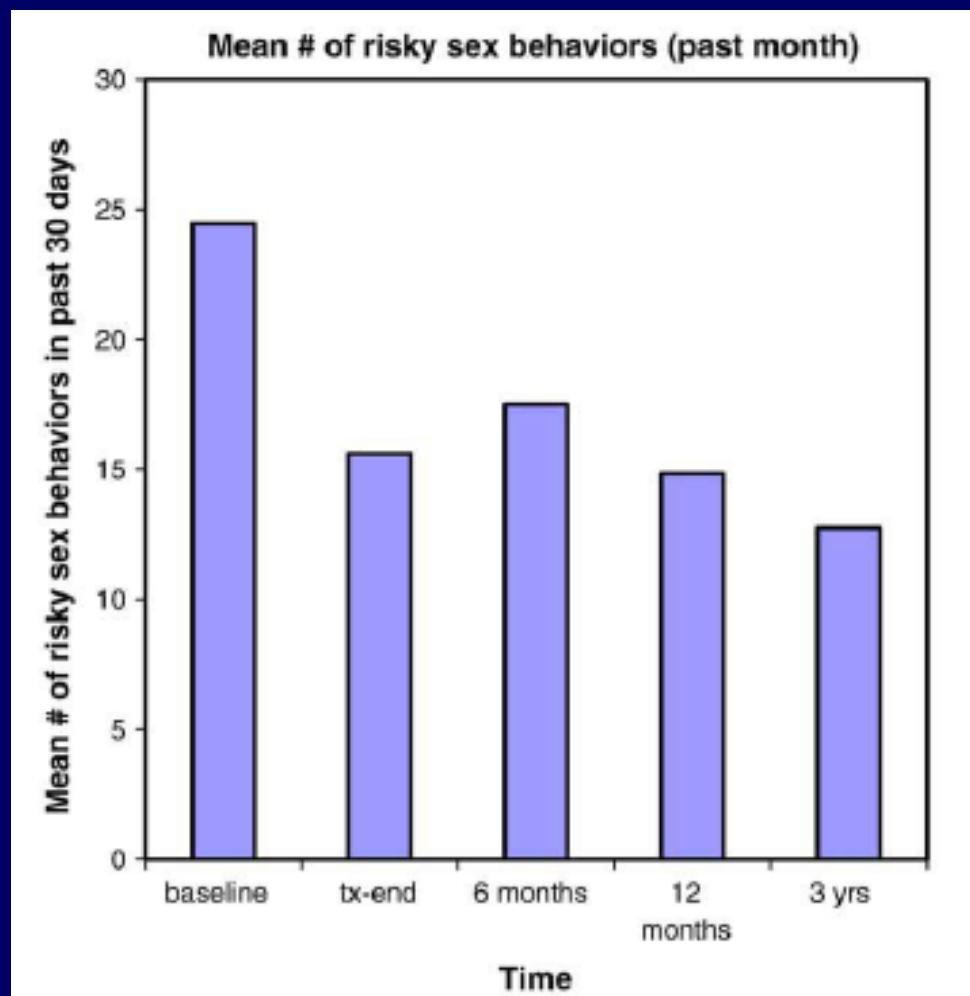
# Results

- The proportion of the sample who reported injecting methamphetamine within the previous 30 days declined significantly (14.6% to 5.4%) from baseline to discharge
- High-risk sexual activity also decreased:

	Baseline	Discharge
Mean times participants reported having sex without a condom	14.7	13.2
Mean times participants reported having sex without a condom with a methamphetamine user	2.3	1.4
Mean times participants reported having sex without a condom with an injection drug user	6.5	1.4
Mean times participants reported having sex while high	9.1	4.9

- There were significant associations between treatment retention and HIV risk outcomes

# Results – long term follow-up



N=569

Rawson RA, et al. *J Subst Abuse Treat.* 2008;35(3):279–284.

CRIT Program 2010

# Comments

- This study demonstrates the benefit of counseling for patients with methamphetamine dependence.
- Treatment was associated with decreased methamphetamine use and decreased risk for HIV infection.
- The association between treatment retention and reduced HIV risk supports the implementation of programs that reduce barriers for treatment entry and retention.

# Cocaine and HIV

- Crack cocaine use is associated
  - increased number of sex partners
  - sex work
  - HIV infection, independent of IVD use
- IV cocaine leads to HIV through frequent injection Chaisson. JAMA. 1989 Jan 27;261(4):561-5.

# MA and HIV

- Increased libido, social disinhibition, increased energy >> riskier sex behaviors
- PDE5 inhibitors (sildenafil) can be used to mitigate MA-induced erectile dysfunction

# Methamphetamine and Trauma

To assess the prevalence and impact of methamphetamine use (MU) in trauma patients, researchers surveyed the records of...

- 4932 patients who presented to
  - San Diego trauma center between 2003–2005
  - urine toxicology screening during their visit

Swanson SM, et al. *J Trauma*. 2007;63(3):531

# Results

- The rate of MU (defined as a positive urine screen), but not other illicit drug use, increased from 2003 to 2005 (from 9% to 15%).
- In adjusted analyses, patients with MU were more likely to have...
  - been injured in a violent way (OR, 2.0),
  - attempted suicide (OR, 1.7),
  - been a victim of domestic violence (OR, 2.5),
  - required more medical care (e.g.,  $\geq 1$  operations [OR, 1.5], mechanical ventilation [OR, 1.6]), and
  - died from their injuries (OR, 2.3).

Swanson SM, et al. *J Trauma*. 2007;63(3):531