

Priority Areas for NIDA

Prevention Research (Children & Adolescents)

genetics

environment

development

co-morbidity

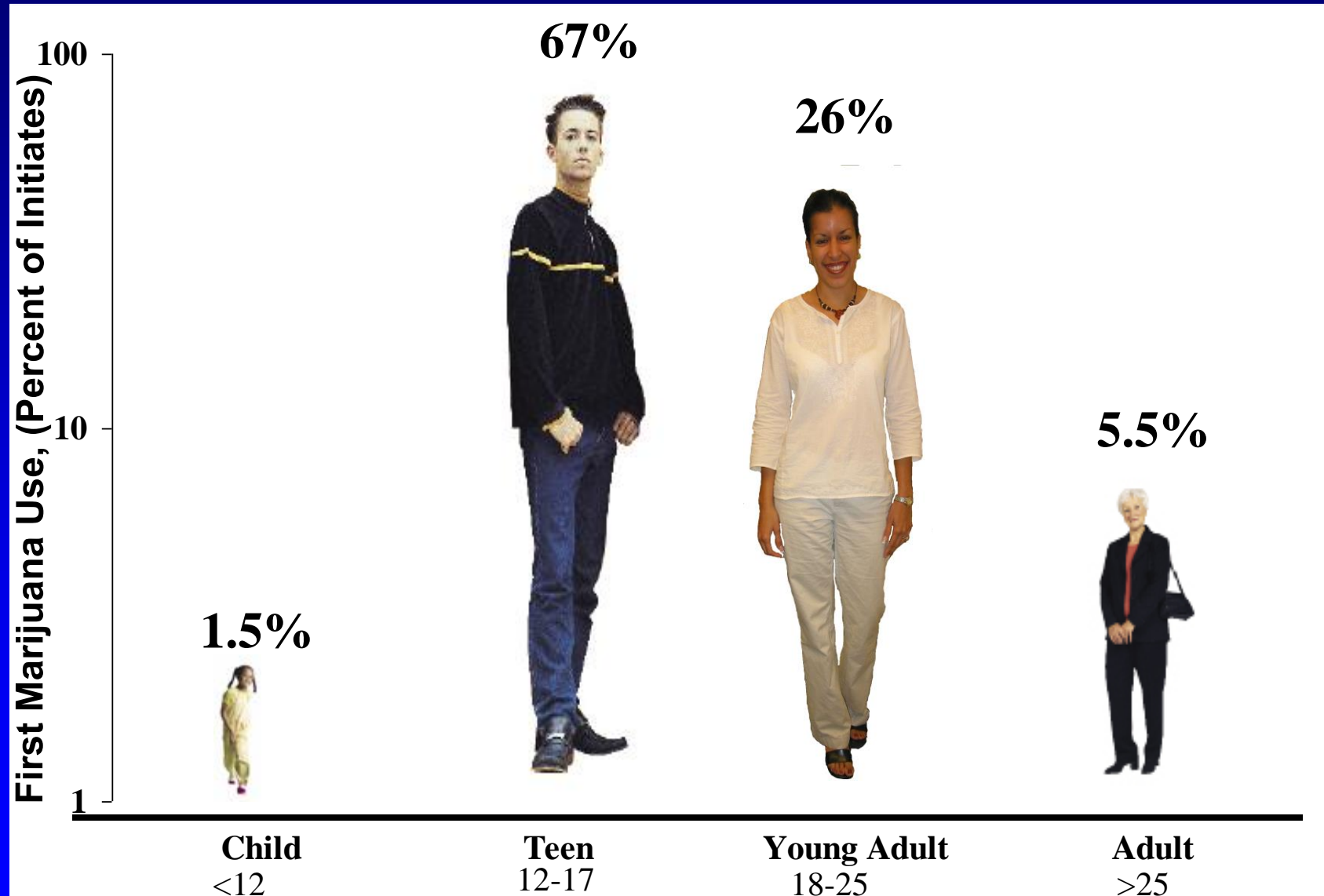
Treatment Interventions

(New Targets & New Strategies)

HIV/AIDS Research



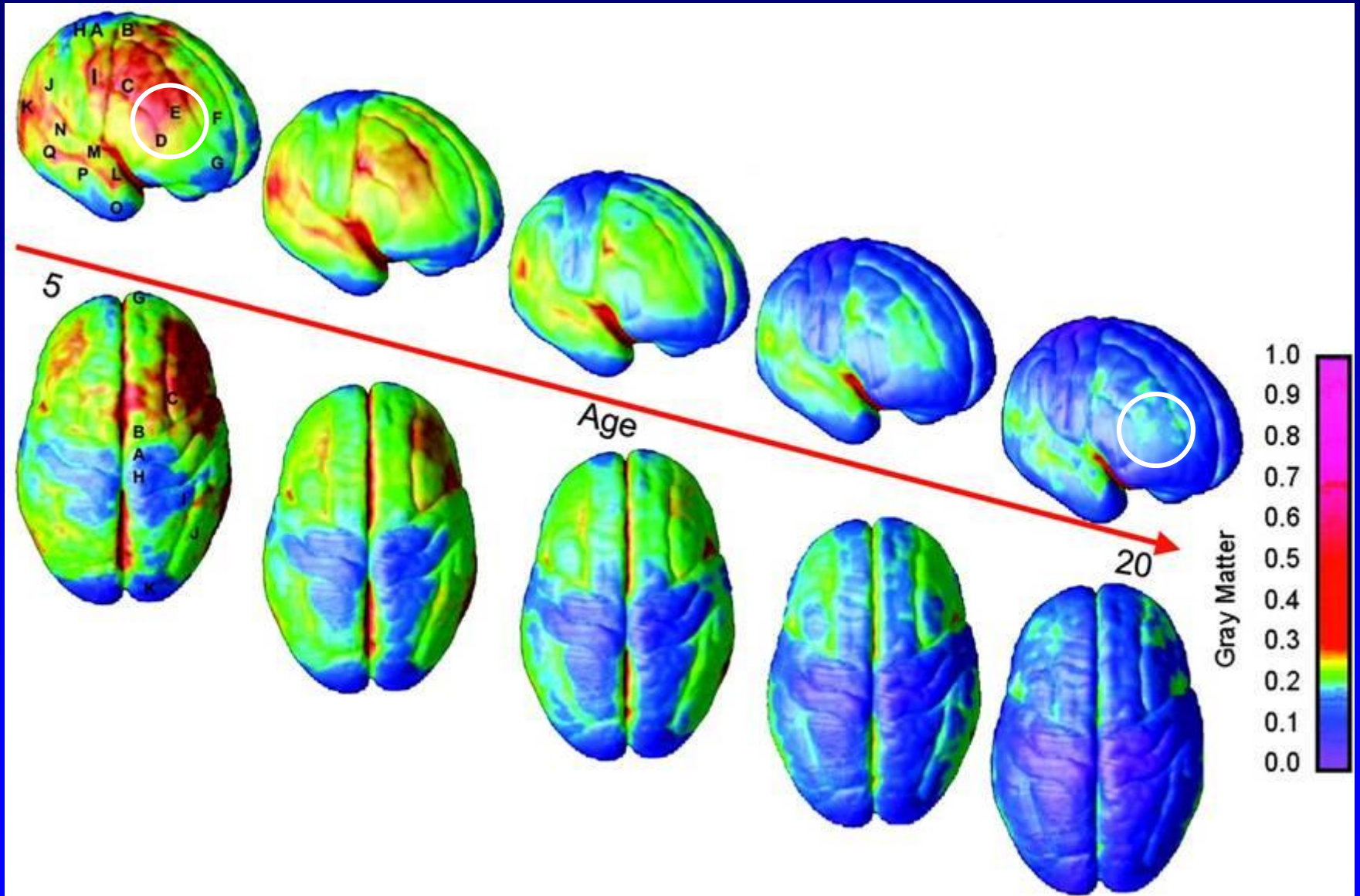
Addiction is a Developmental Disease: It Starts Early



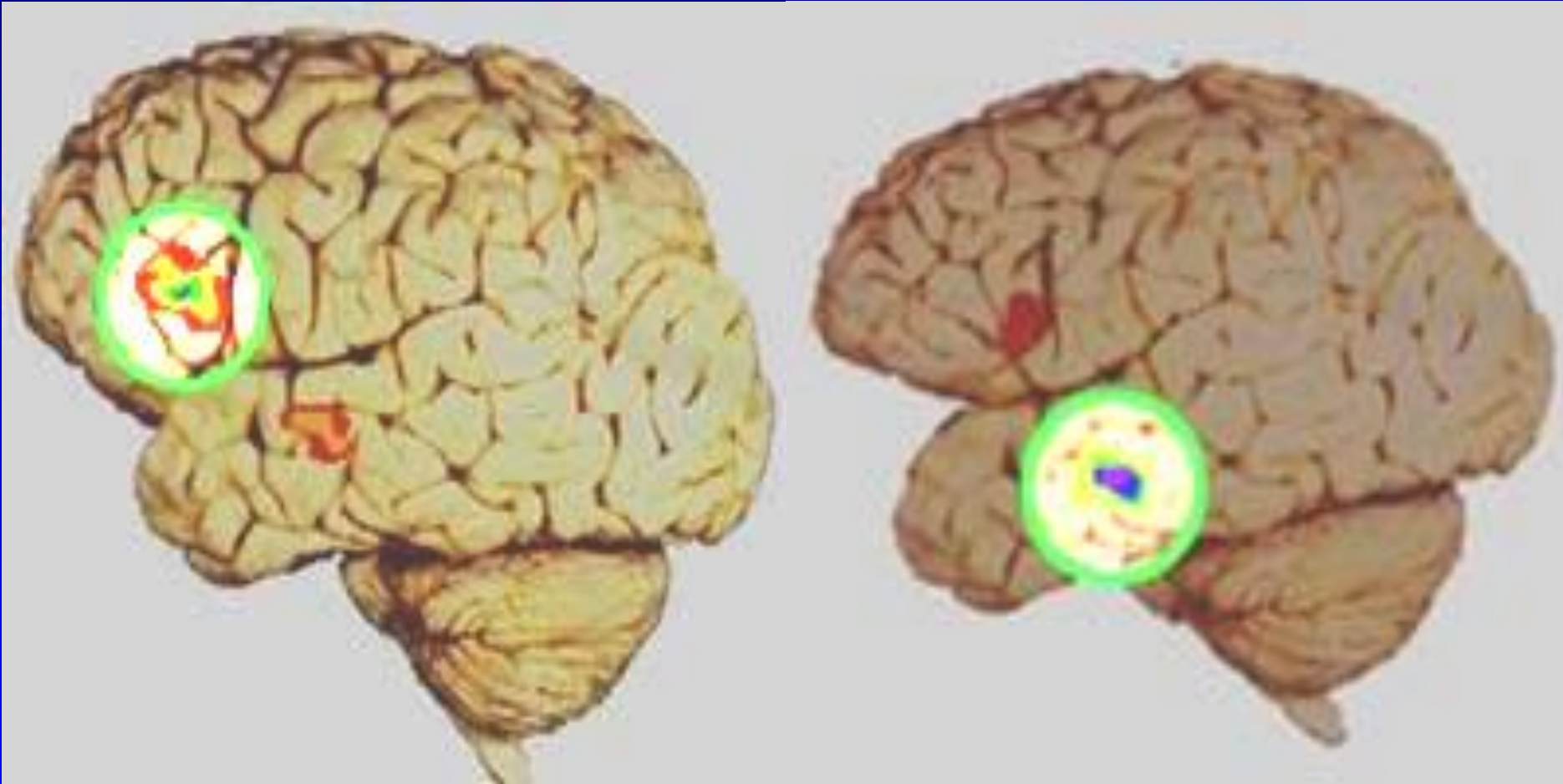
Basic Science Tells Us that Adolescents' Brains Are Still Developing...



MRI Scans of Healthy Children and Teens Over Time



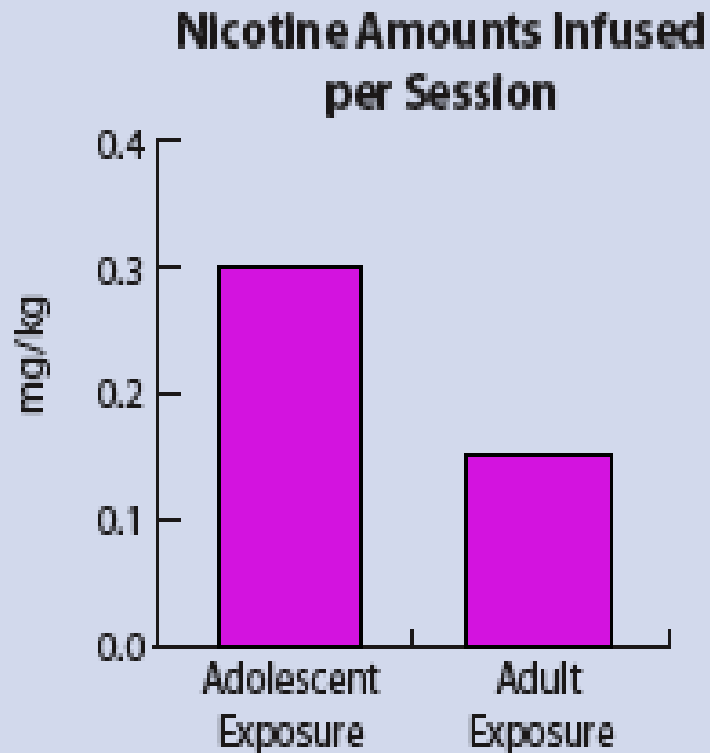
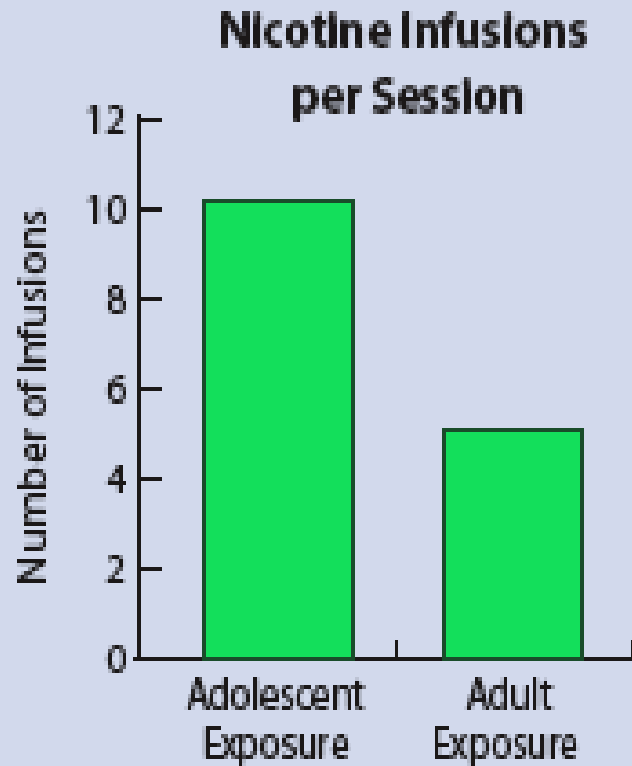
When Reading Emotion...
**Adults Rely More on the Frontal Cortex
While Teens Rely More on the Amygdala**



Source: Deborah Yurgelon-Todd 2000.

**Do Adolescents React Differently
than Adults to
Substances of Abuse?**

Rats Exposed to Nicotine in Adolescence Self-Administer More Nicotine Than Rats First Exposed as Adults

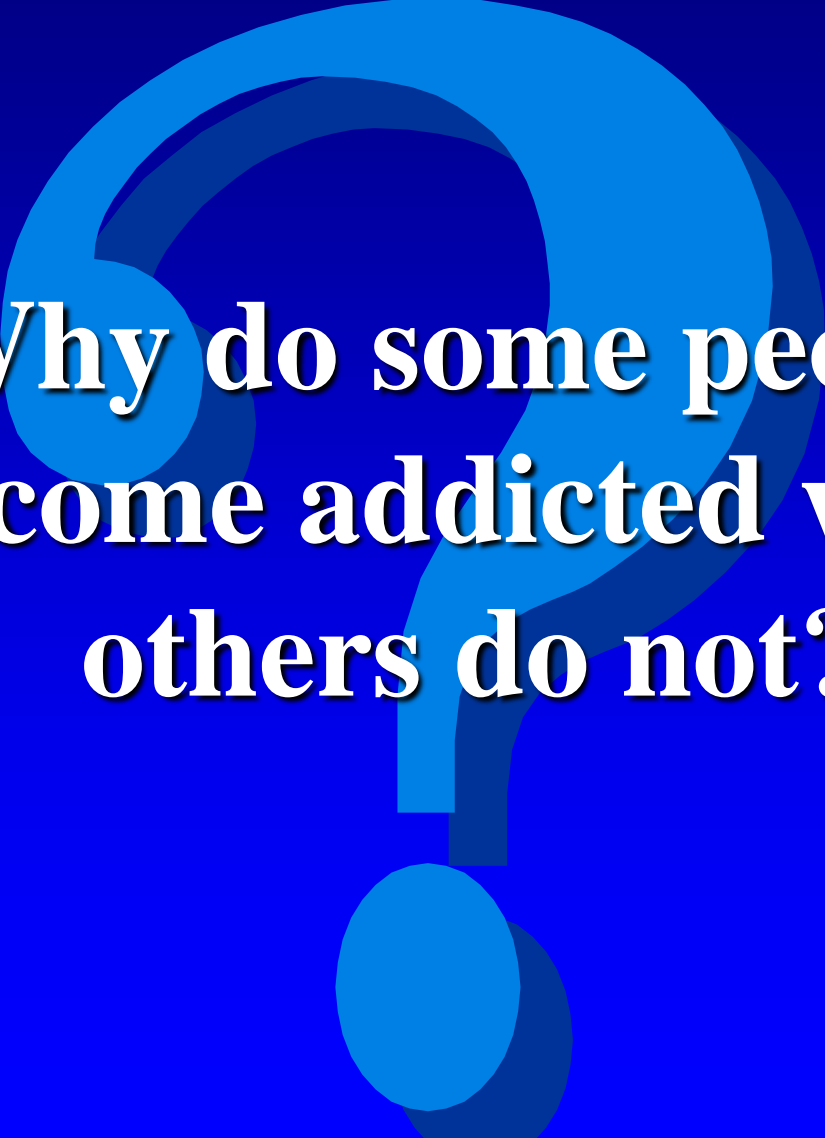




Do We Need Fundamentally Different Strategies At Different Stages of Adolescence?



Vulnerability



**Why do some people
become addicted while
others do not?**

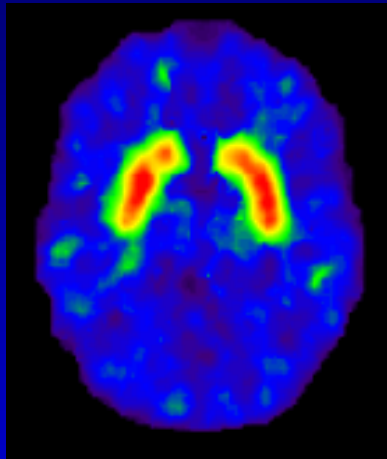


**We Know There's A
Big Genetic Contribution To
Drug Abuse and Addiction...**

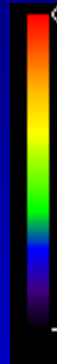
**And the Nature of this Contribution
Is Extremely Complex**

DA Receptors and the Response to Methylphenidate (MP)

High DA
receptor

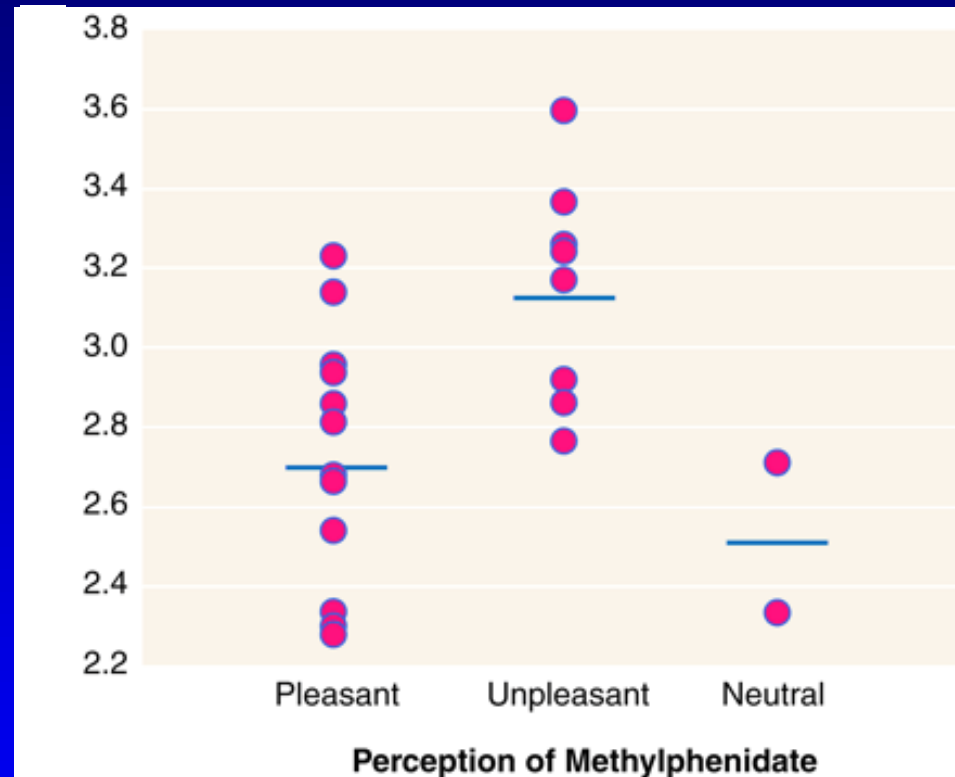
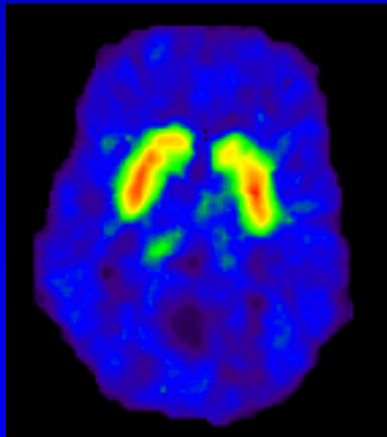


high



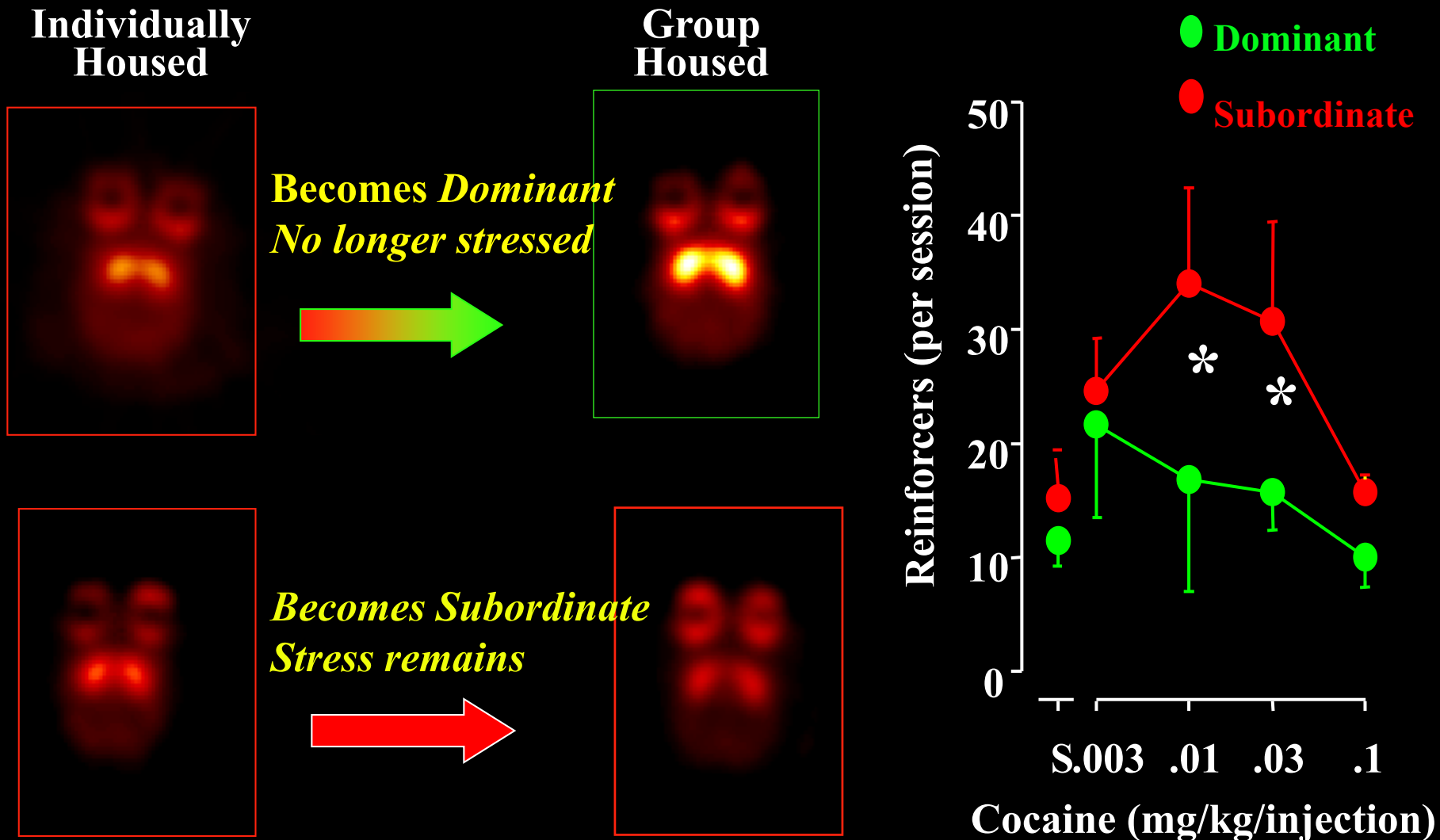
low

Low DA receptor



As a group, subjects with low receptor levels found MP pleasant while those with high levels found MP unpleasant

Effects of a Social Stressor on Brain DA D2 Receptors and Propensity to Administer Drugs



What Other Environmental Factors Contribute to Addiction?

Co-morbid mental illness

Early physical or sexual abuse

Witnessing violence

Stress

Peers who use drugs

Drug availability

COMORBIDITY



Drug Users have a Higher Risk of Developing Mental Disorders

- Psychosis
- Depression
- Anxiety
- Panic attacks

Example: SMOKING EPIDEMIOLOGY

normal population:	23%
alcoholism:	90%+
other addictions:	90%+
schizophrenia:	85%
depression:	80%

Why do Mental Illnesses and Substance Abuse Co-occur?

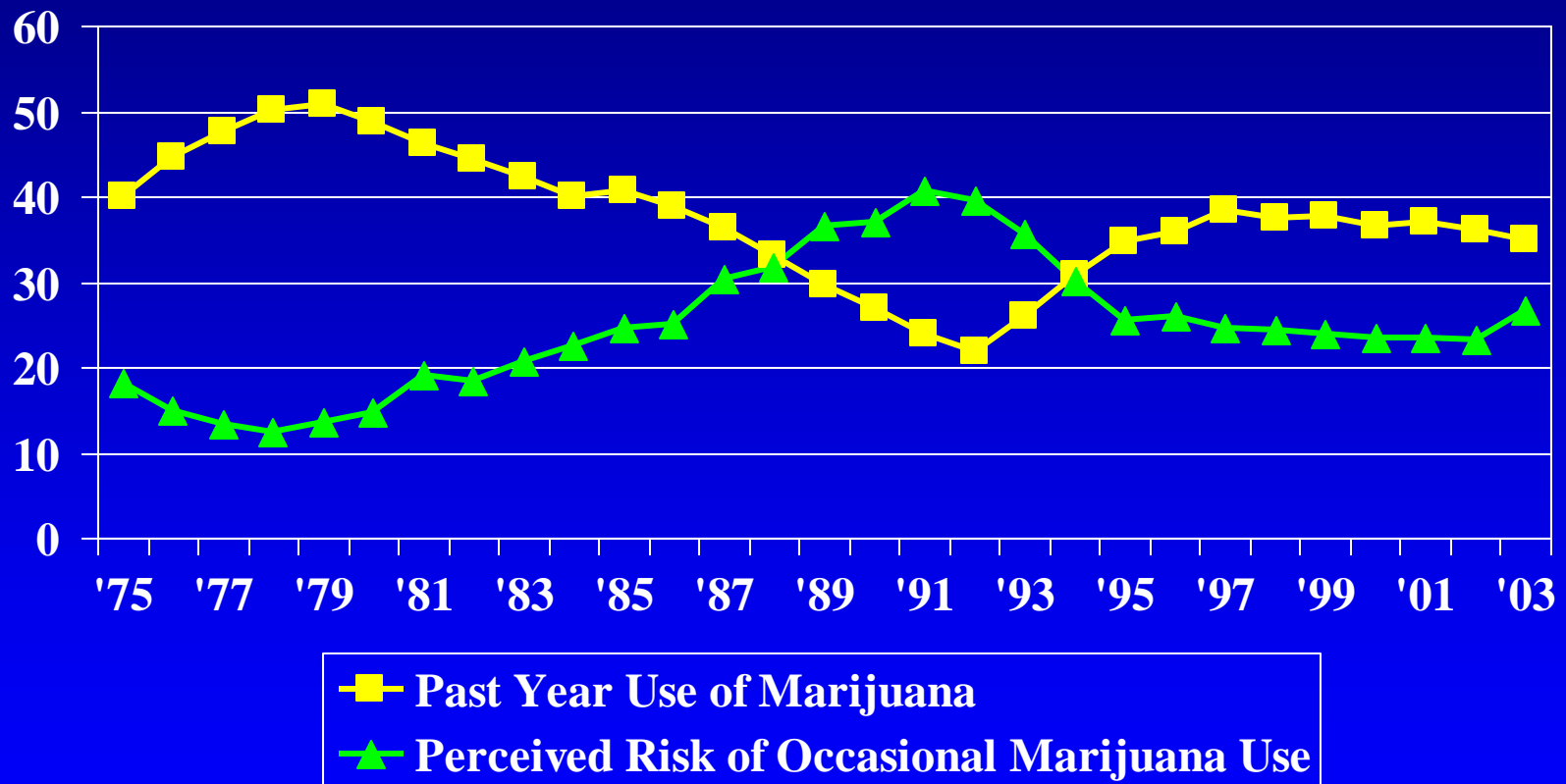


- **Self-medication hypothesis**
 - substance abuse begins as a means to alleviate symptoms of mental illness
- **Causal effects of substance abuse**
 - Substance abuse may increase vulnerability to mental illness
- **Common or correlated causes**
 - the life processes and risk factors that give rise to mental illness and substance abuse may be related or overlap

Prevention Works



Changes in Attitudes Lead to Changes in Use



Source: Monitoring the Future Study, 2003.

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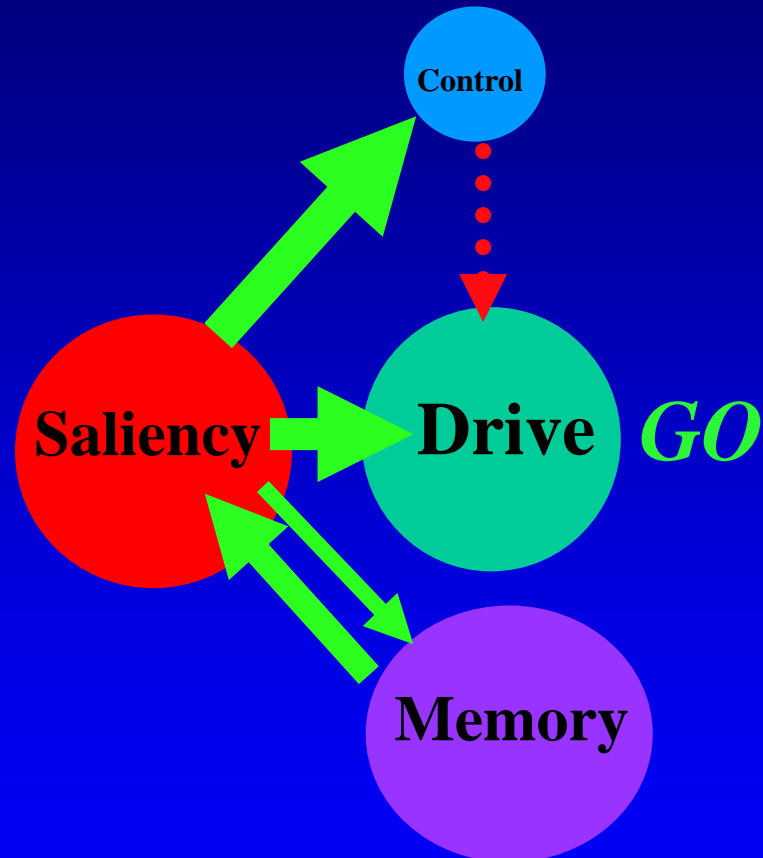
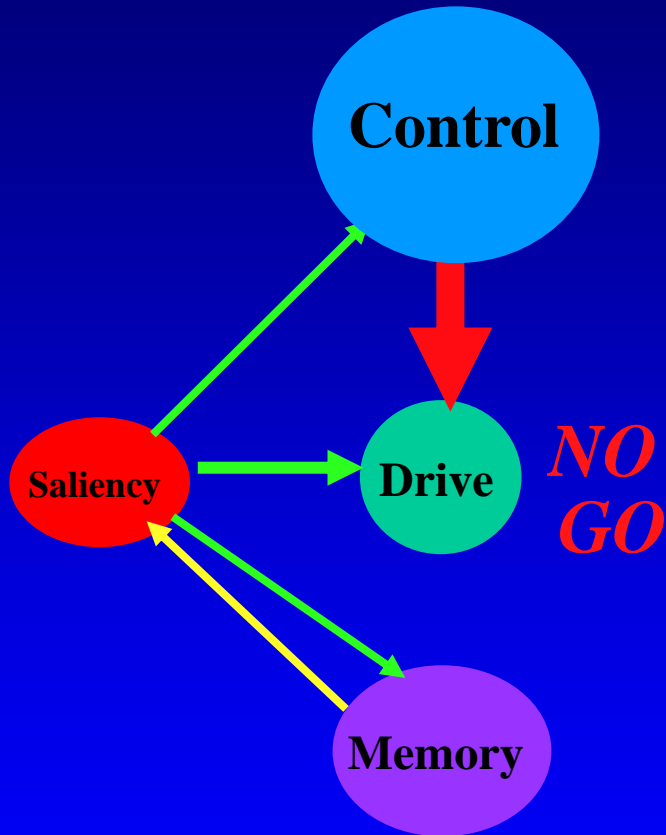
HIV/AIDS Research



Why Can't Addicts Just Quit?

Non-Addicted Brain

Addicted Brain



Because Addiction Changes Brain Circuits

Source: Adapted from Volkow et al., Neuropharmacology, 2004.

This is why addicts can't just quit

This is why treatment is essential

Treating a Biobehavioral Disorder Must Go Beyond Just Fixing the Chemistry

We Need to Treat the Whole Person!

**Pharmacological
(medications)**

Behavioral Therapies

Medical and

Social Services

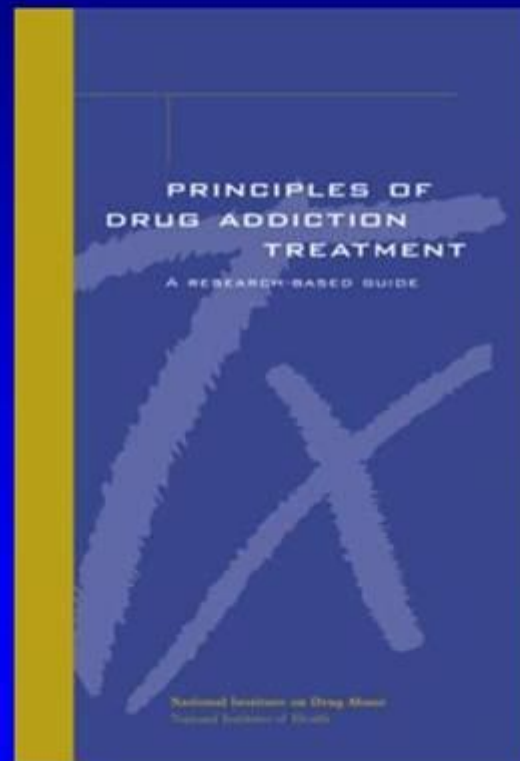
In Social Context



Treatment Can Work

NIDA's Principles of Treatment

- No single treatment is appropriate for all individuals.
- Treatment needs to be readily available.
- Treatment must attend to multiple needs of the individual, not just drug use.
- Multiple courses of treatment may be required for success.
- Remaining in treatment for an adequate period of time is critical for treatment effectiveness.



We Are Using Science to Develop Even Better Treatments



Basic Research



Medication

Opiate agonists stabilize brain function in heroin addicts



Agonist Therapy
Methadone
Buprenorphine

CB1 KO mice have decreased responses to multiple drugs of abuse



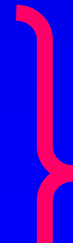
CB1 Antagonists

Smokers who are poor nicotine metabolizers smoke less



**Inhibitors of
metabolizing
enzymes**

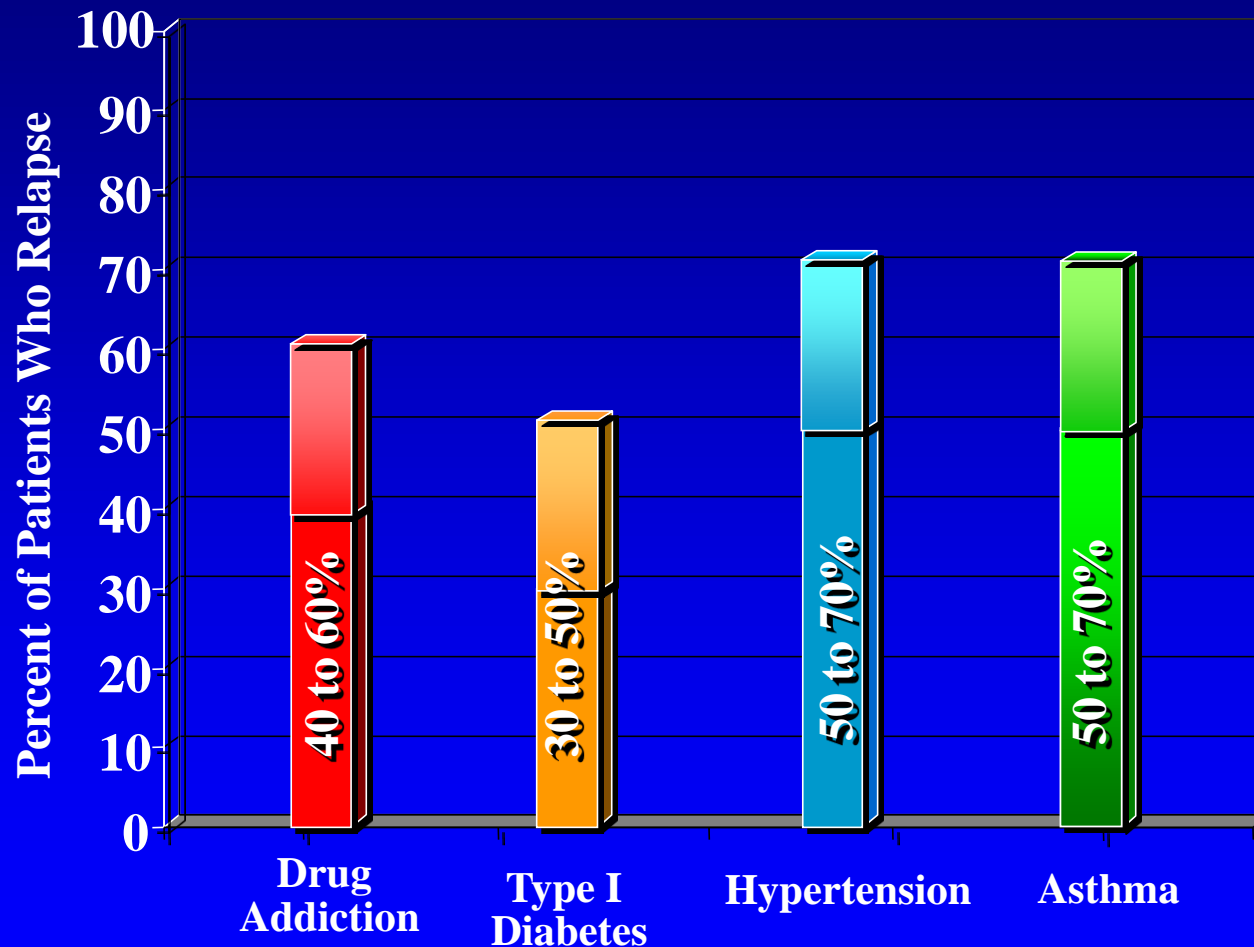
Stress triggers relapse in animal models of addiction and CRF antagonists interfere with the response to stress



CRF Antagonists

But, drug addiction is a chronic illness with relapse rates similar to those of hypertension, diabetes, and asthma

Relapse Rates Are Similar for Drug Addiction & Other Chronic Illnesses



McLellan et al., JAMA, 2000.

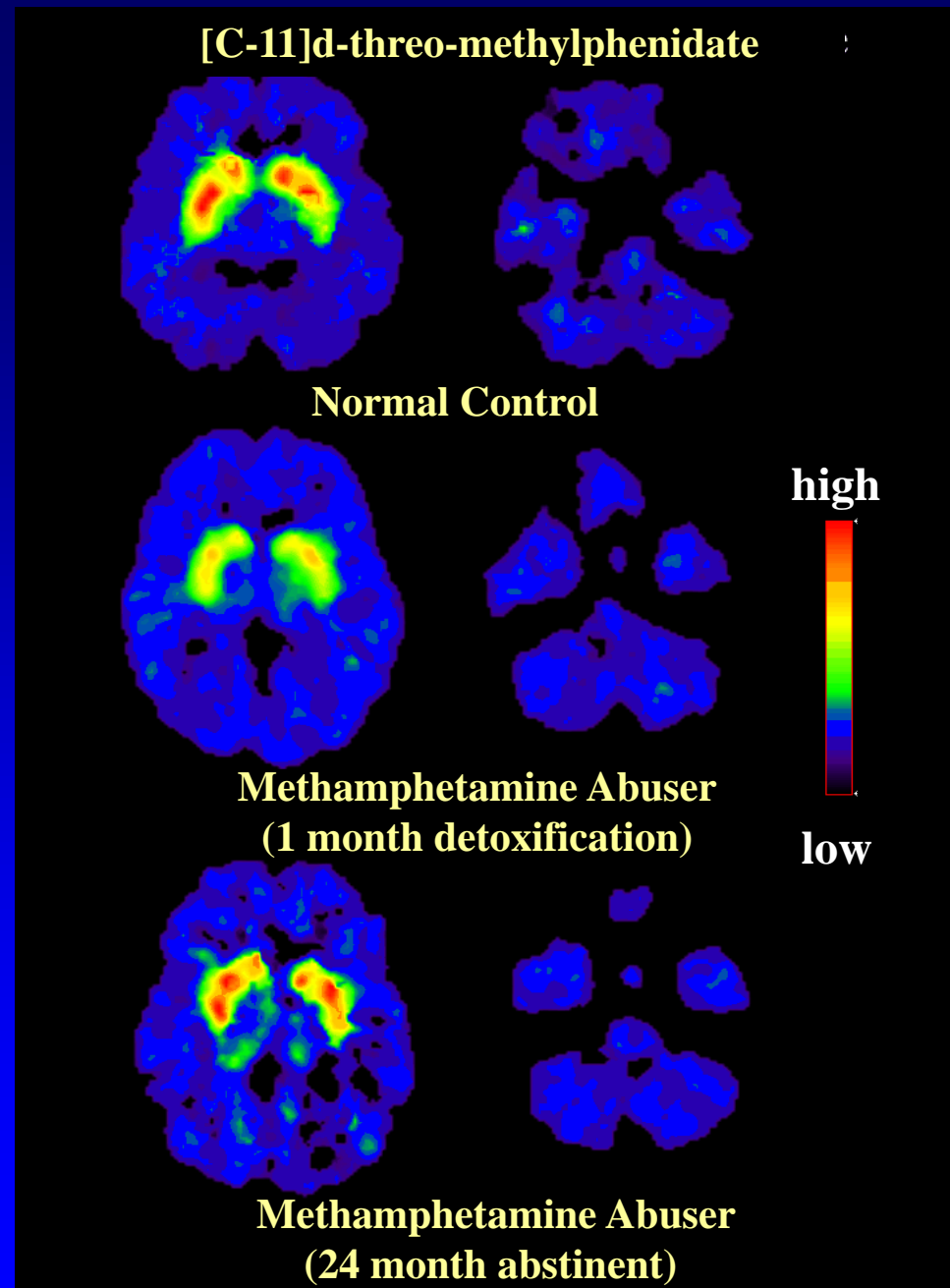
Addiction is Similar to Other Chronic Illnesses Because:

- Recovery from it--protracted abstinence and restored functioning--is often a long-term process requiring repeated treatments
- Relapses to drug abuse can occur during or after successful treatment episodes
- Participation in self-help support programs during and following treatment can be helpful in sustaining long-term recovery

Therefore...

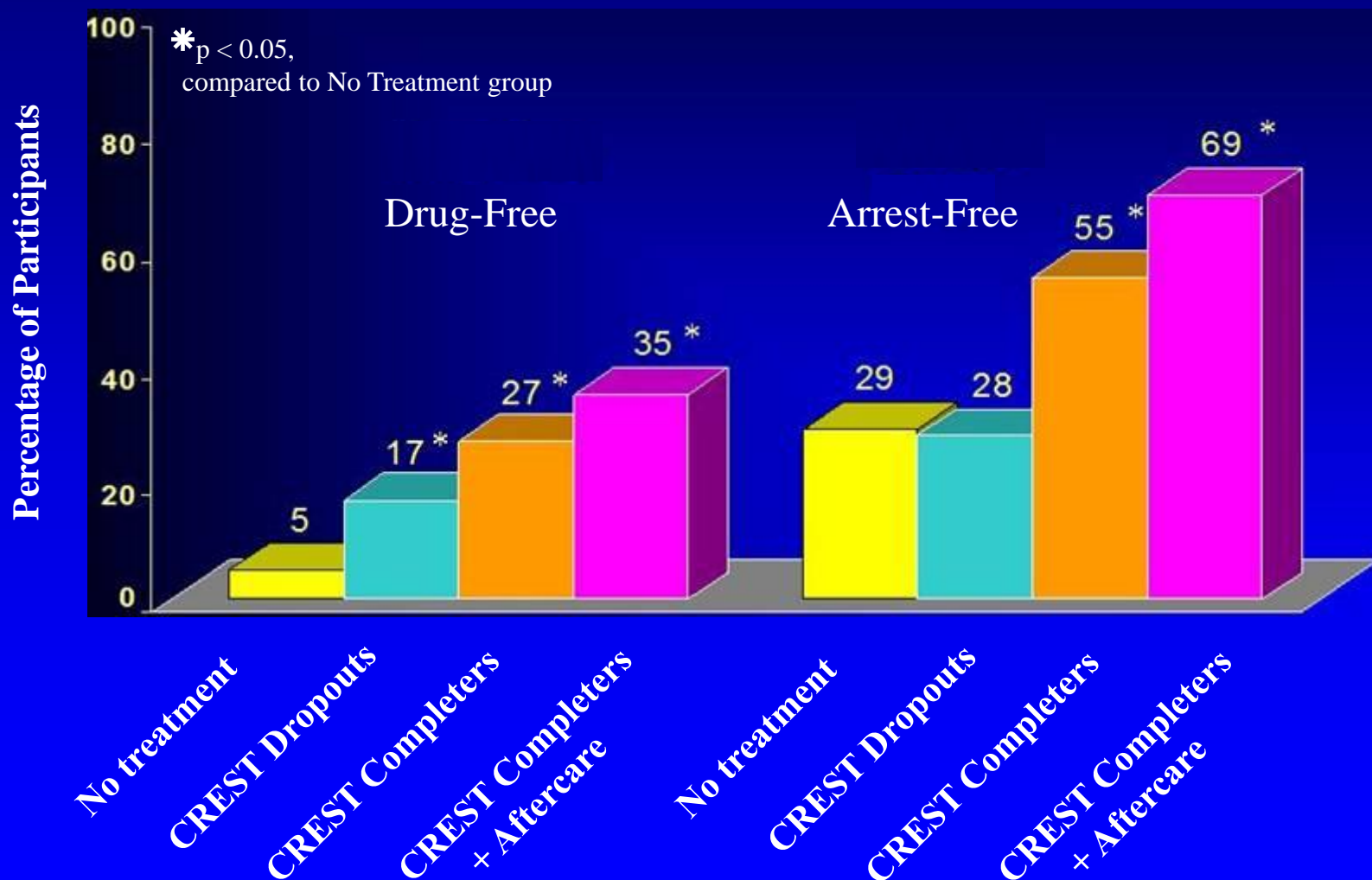
**Full recovery is a challenge
but it is possible ...**

DAT Recovery with prolonged abstinence from methamphetamine



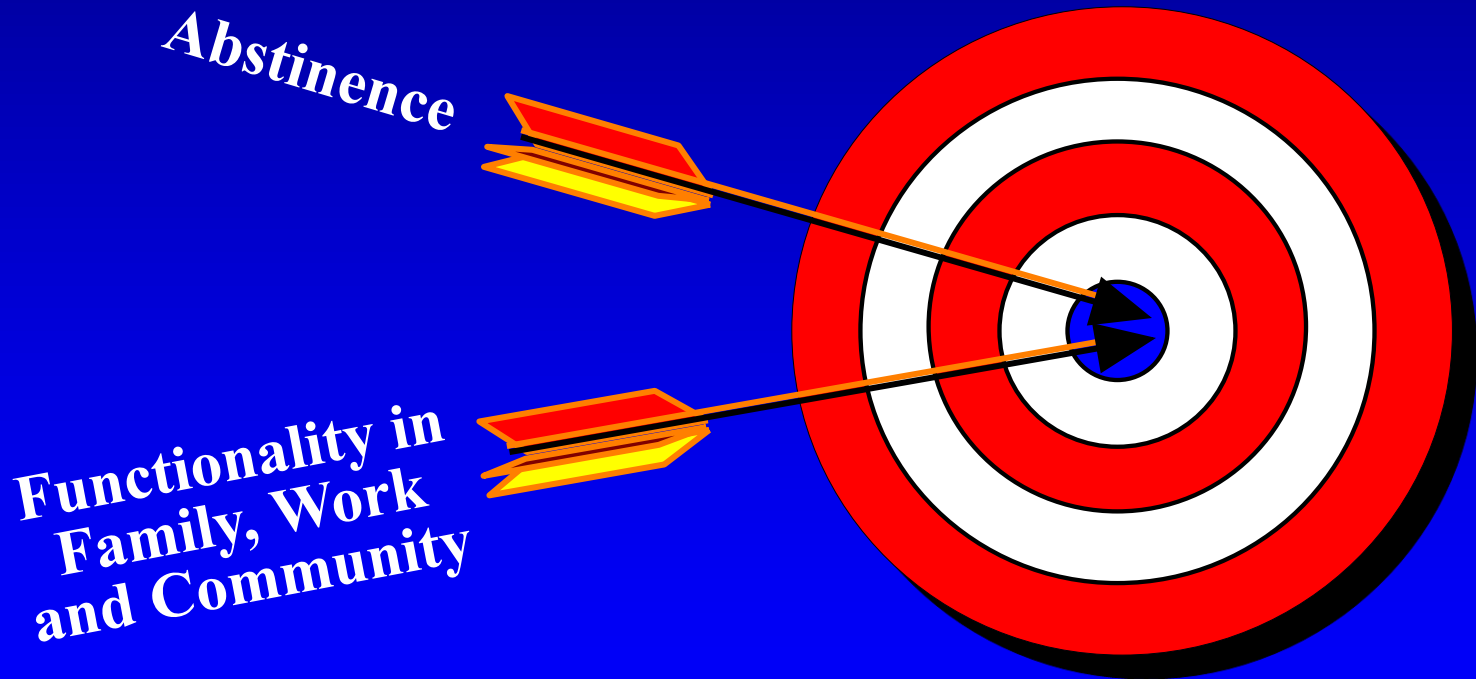
Treatment Reduces Drug Use and Recidivism

Delaware Work Release Therapeutic Community (CREST) + Aftercare
3 Years After Release (N=448)



In Treating Addiction...

We Need to Keep Our Eye on the Real Target



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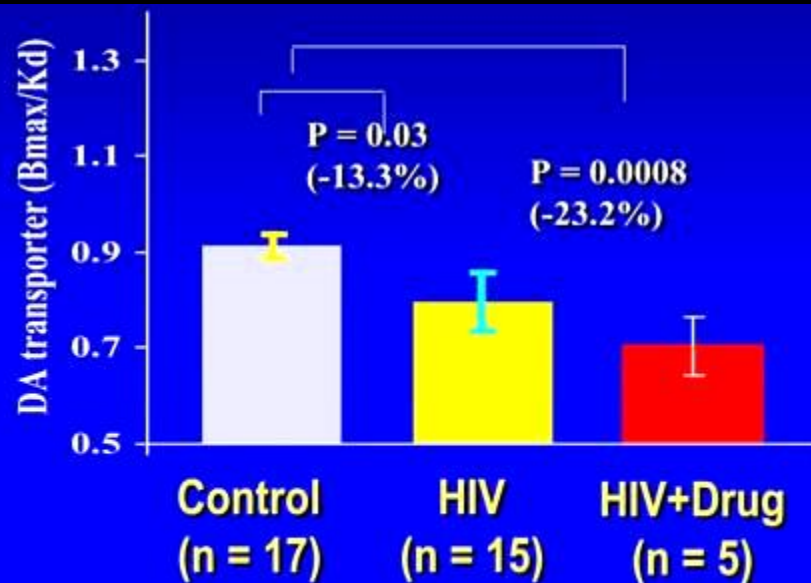
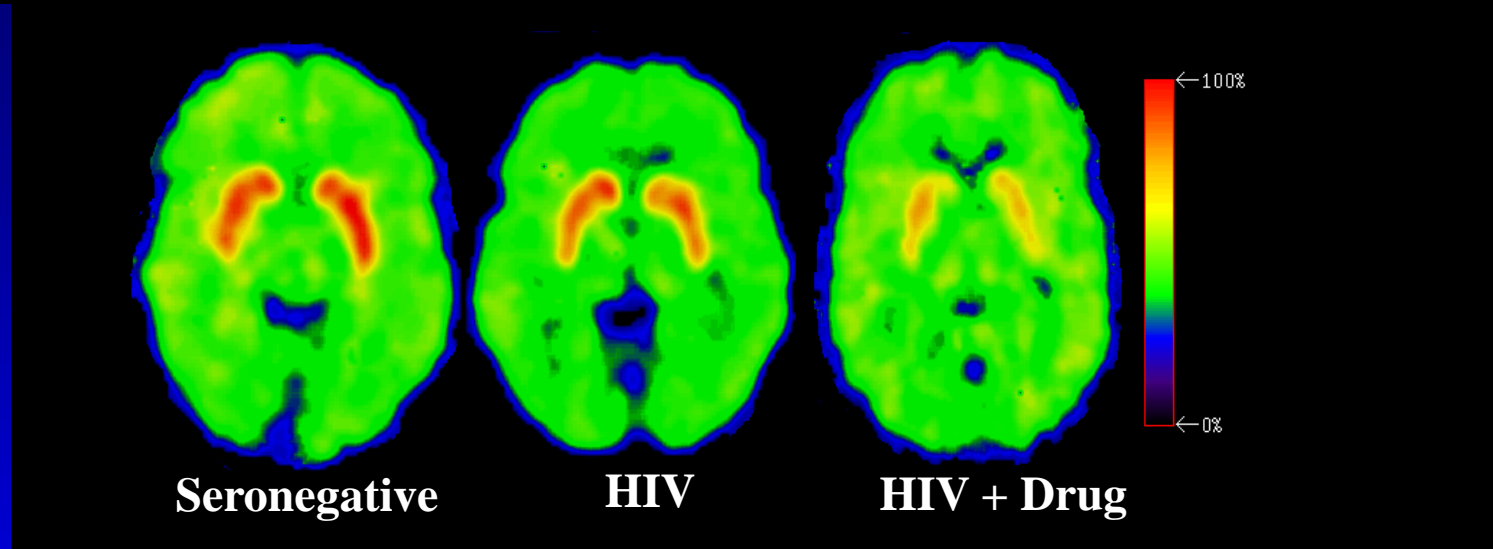
Drug Use Has Played a Prominent Role in the HIV/AIDS Epidemic In Several Ways

Disease Transmission

- **IV Drug Use**
- **Drug User Disinhibition Leading to High Risk Sexual Behaviors**

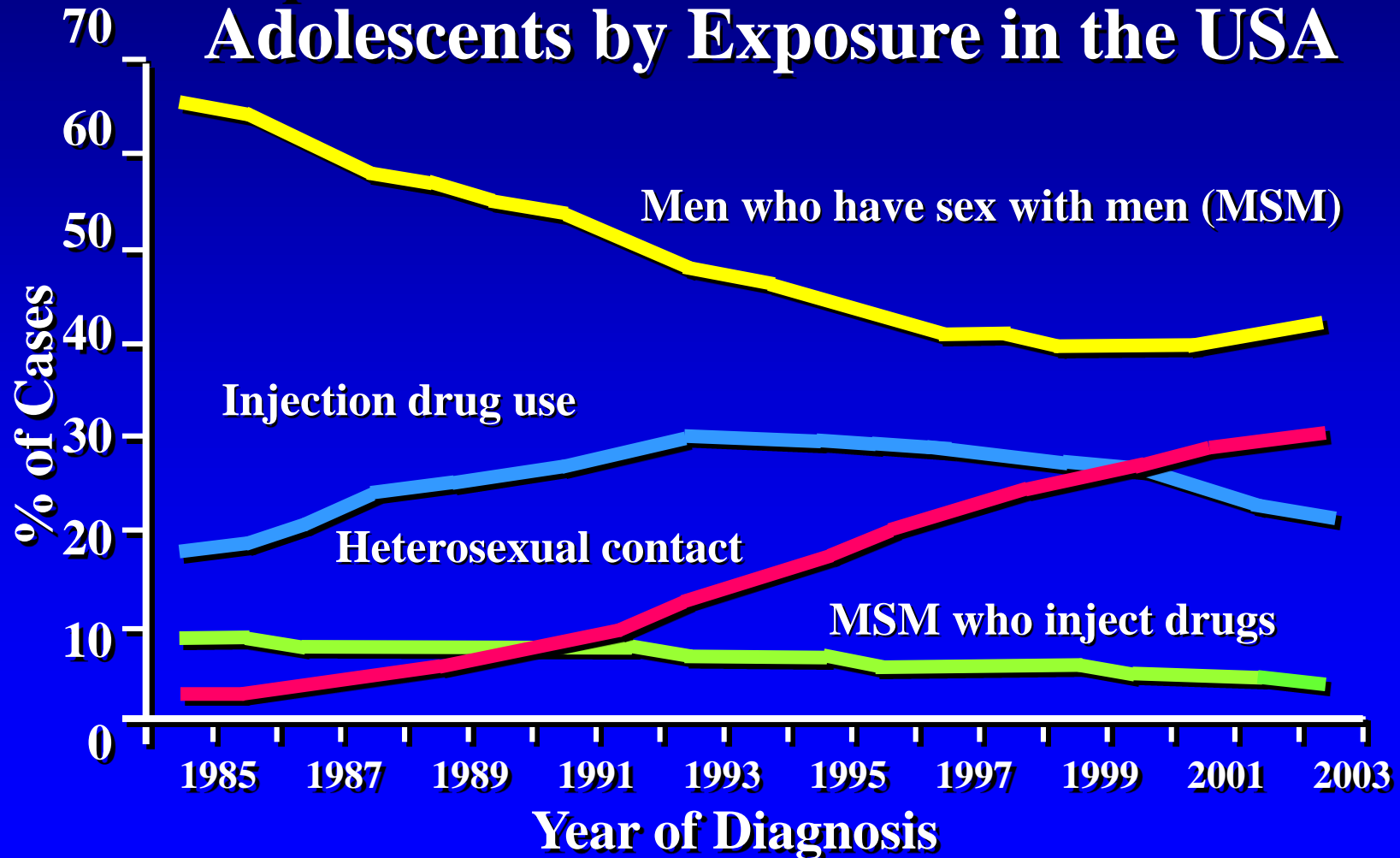
Progression of Disease

Acceleration of HIV Degeneration of Dopamine Cells With Cocaine



Drugs of Abuse Have Had A Major Impact on the HIV/AIDS Epidemic

Proportions of AIDS Cases in Adults & Adolescents by Exposure in the USA



Source: Centers for Disease Control and Prevention (CDC)

NIDA International Program Components



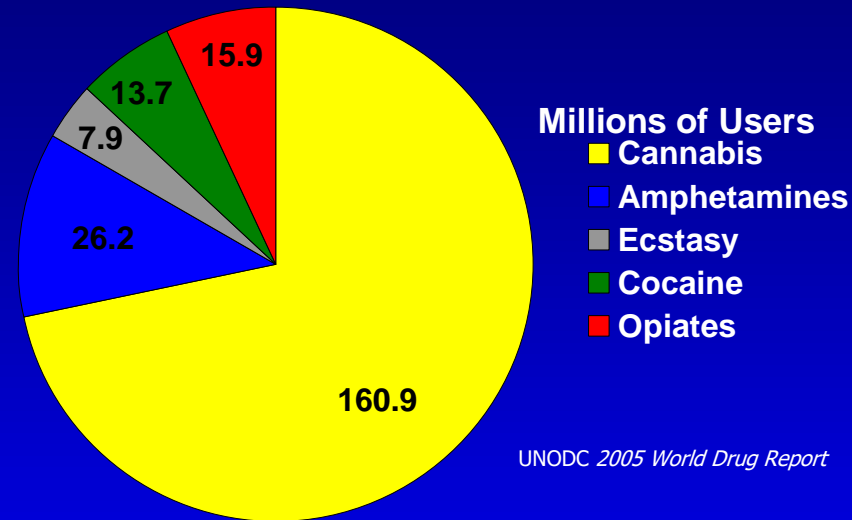
Why focus on drug abuse internationally?

I. Drug abuse is a global phenomenon

🌐 5 percent of people aged 15-64

II. Intertwined dual-epidemics of drug addiction & HIV/AIDS

🌐 HIV Infections Attributed to Injection Drug Use and Risky Sexual Behaviors Related to Drug Abuse



III. Take advantage of unique opportunities to advance scientific knowledge through research

NIDA Supports International Drug Abuse Research In Numerous Ways

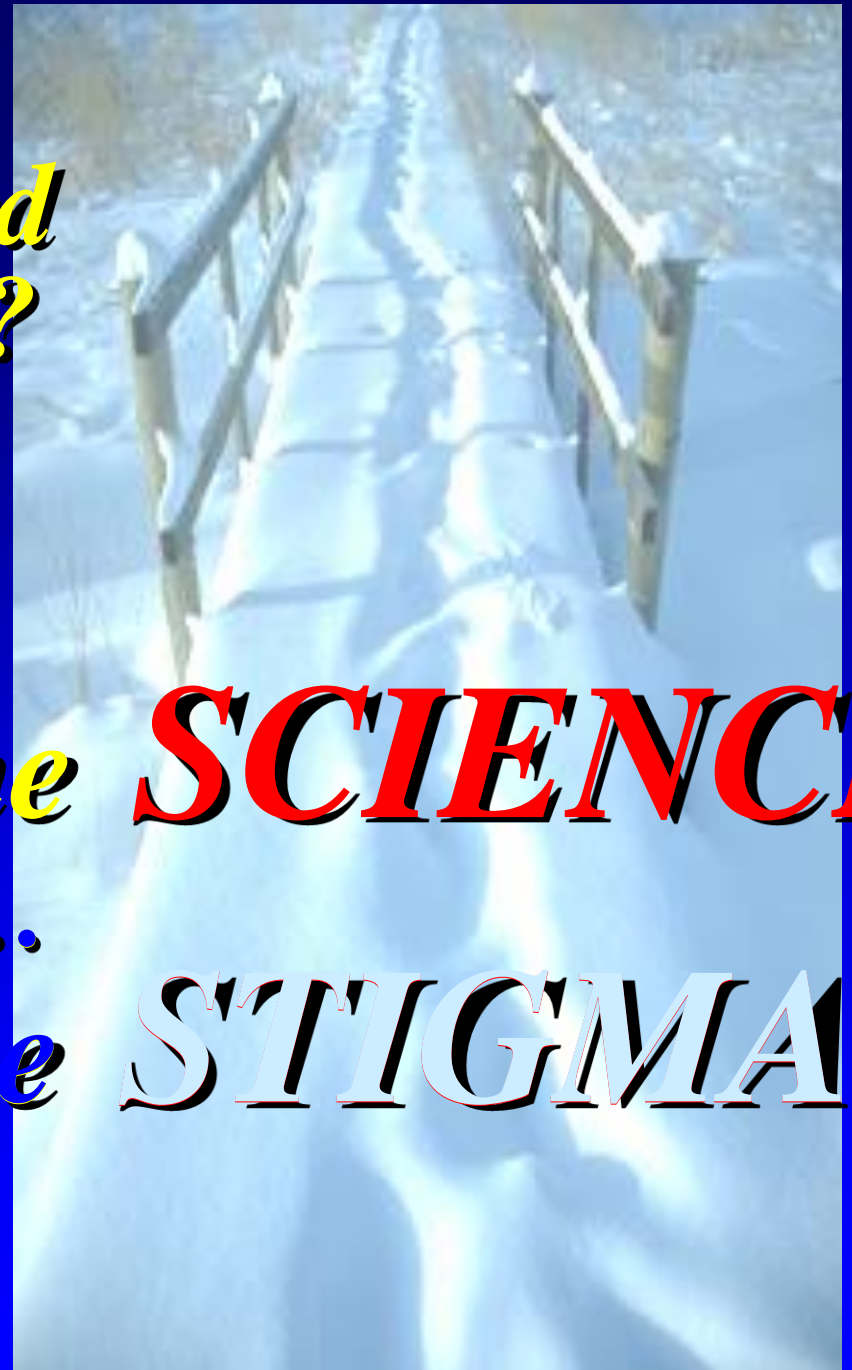
- ① Fund international research
- ① Provide training and exchange opportunities
- ① Set international research priorities
- ① Organize & sponsor conferences and meetings
- ① Binational agreements
- ① Dissemination of information

***Where Do We Need
to Go From Here?***

We Need to...

Advance the **SCIENCE**
and to...

Erase the **STIGMA**



For More Information

NIDA Public Information:

www.nida.nih.gov

www.drugabuse.gov

NIDA International Program:

www.international.drugabuse.gov