

Drug Abuse and Addiction: *What the Research Says*

National Library of Medicine

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Director

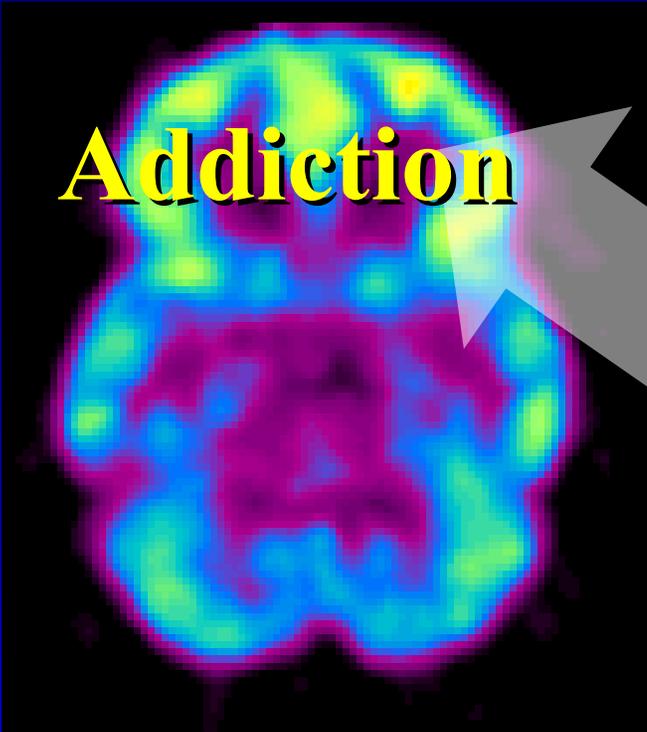
Community-Based Public Health
School of Public Health
University of Michigan

Former Medical Officer and Special Assistant

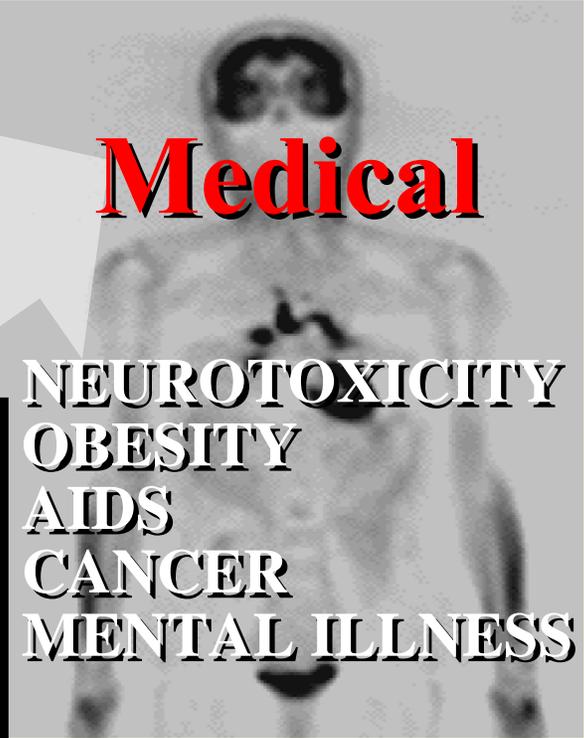
National Institutes of Health

Former “Deputy Drug Czar”

White House Office of National Drug Control Policy



Addiction



Medical

DRUGS

NEUROTOXICITY
OBESITY
AIDS
CANCER
MENTAL ILLNESS



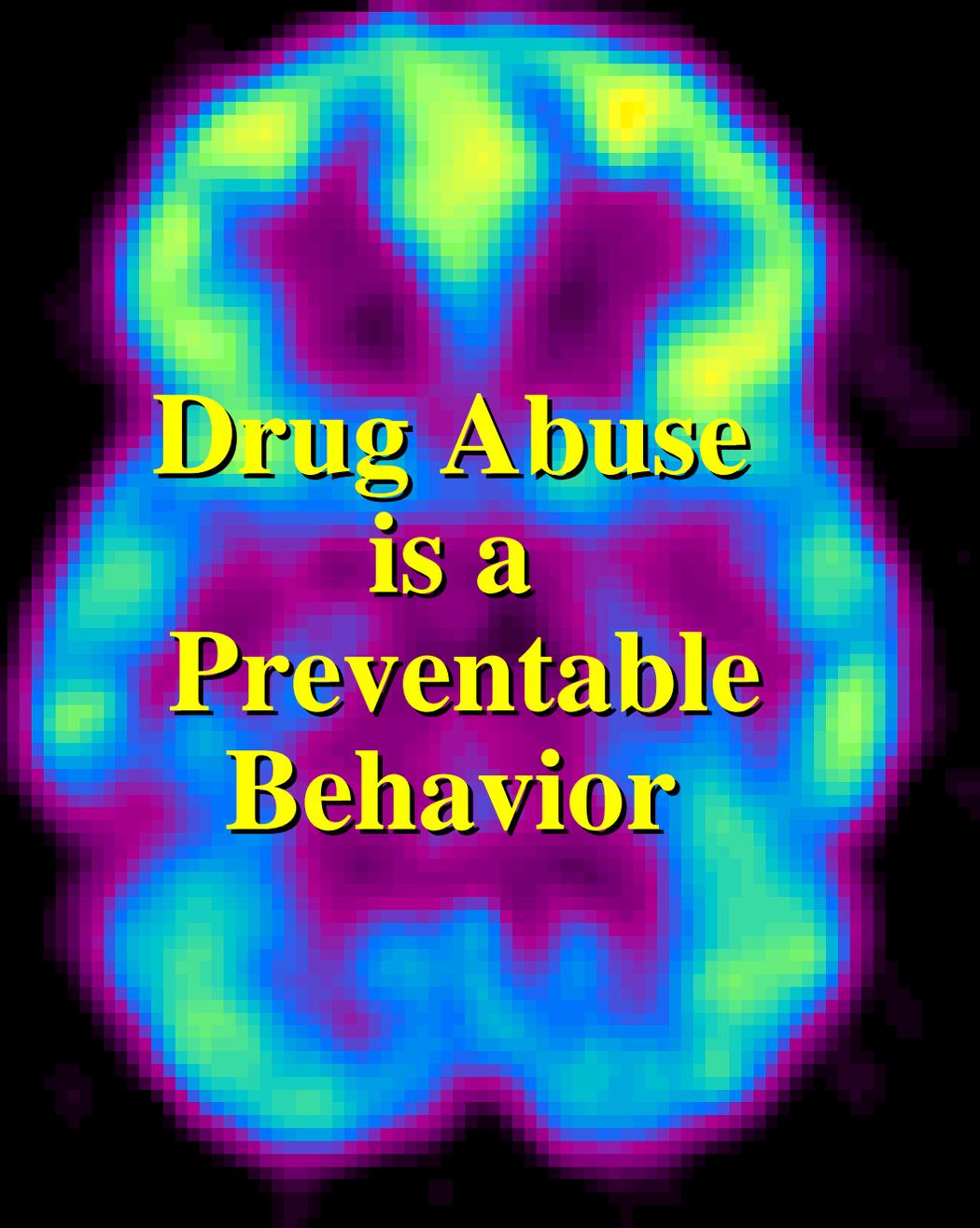
Economic

HEALTH CARE
COSTS
PRODUCTIVITY
LOSS
ACCIDENTS



Social

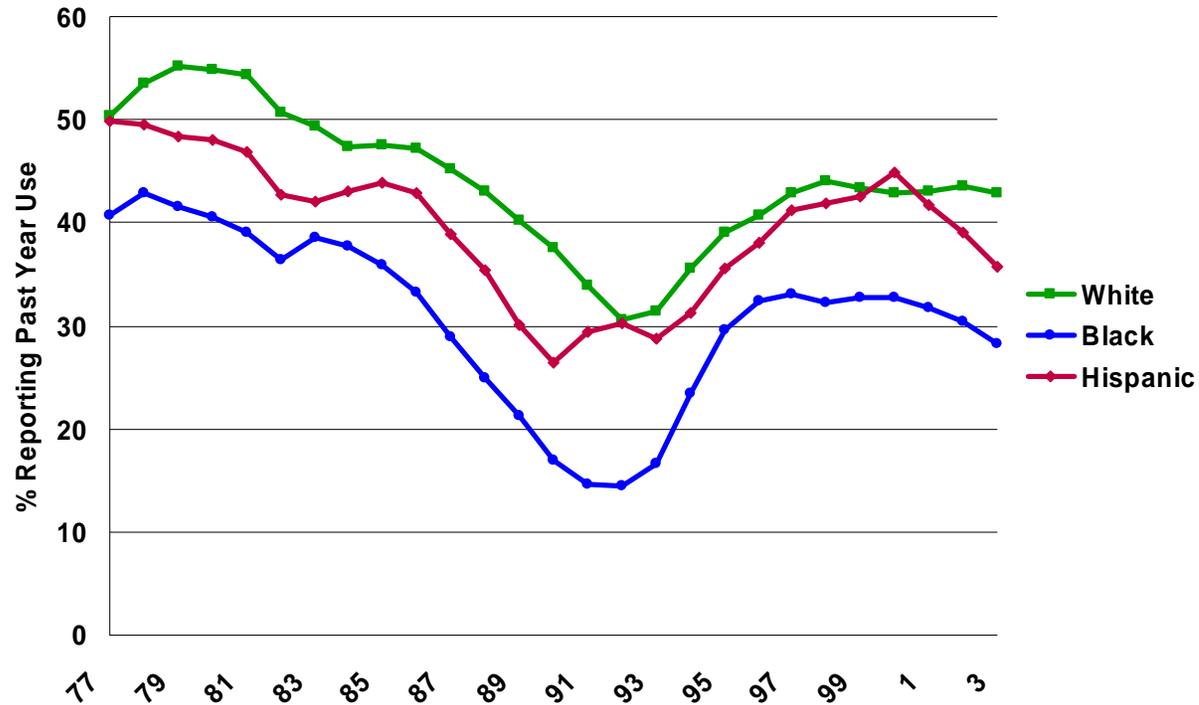
HOMELESSNESS
CRIME
VIOLENCE



**Drug Abuse
is a
Preventable
Behavior**

Among high school seniors, blacks consistently have the lowest rate of illicit drug use, with hispanics catching up with whites in 2000.

Percent Reporting Past Year Use of Any Illicit Drug



Source: *Monitoring the Future Study, using two-year averages.*

**Drugs of Abuse
Engage Systems
in the
*Motivation and
Pleasure Pathways
of the Brain***



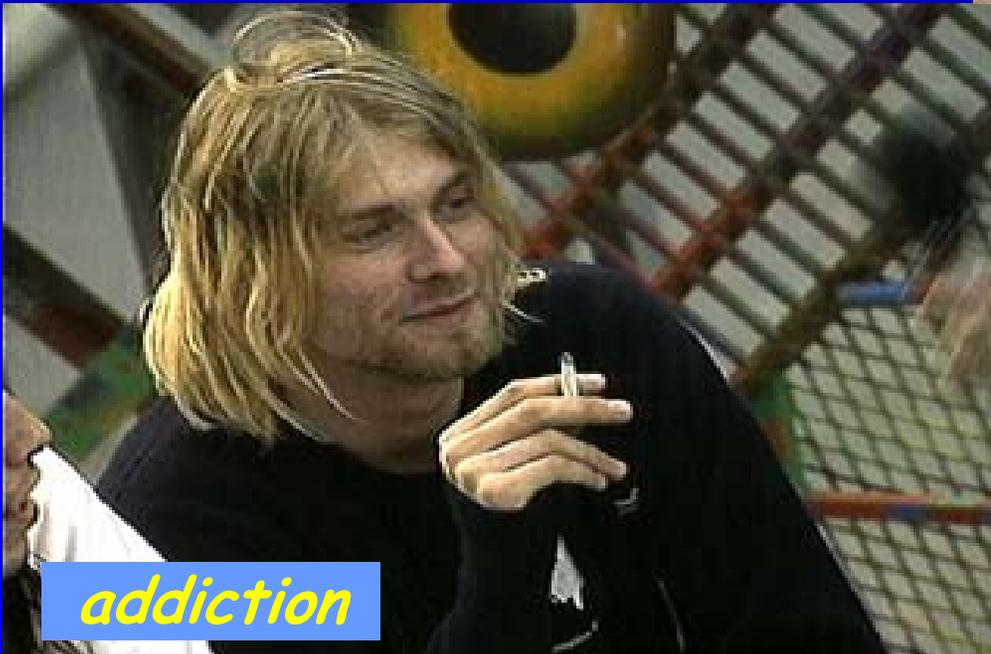


MOVEMENT



motivation

Dopamine

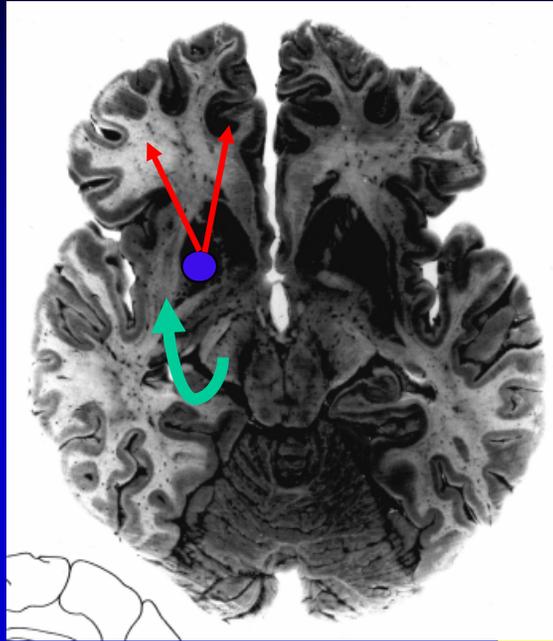


addiction

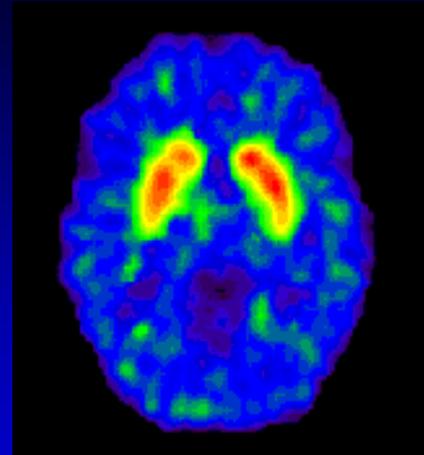


Reward & well-being

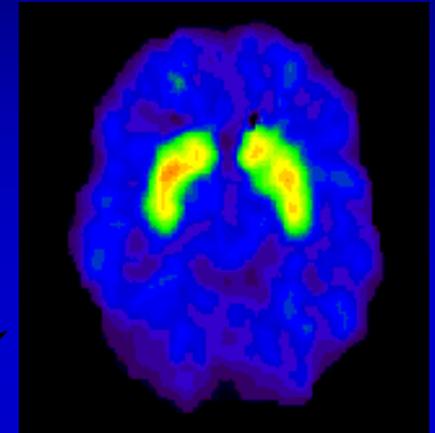
Brain Dopamine System



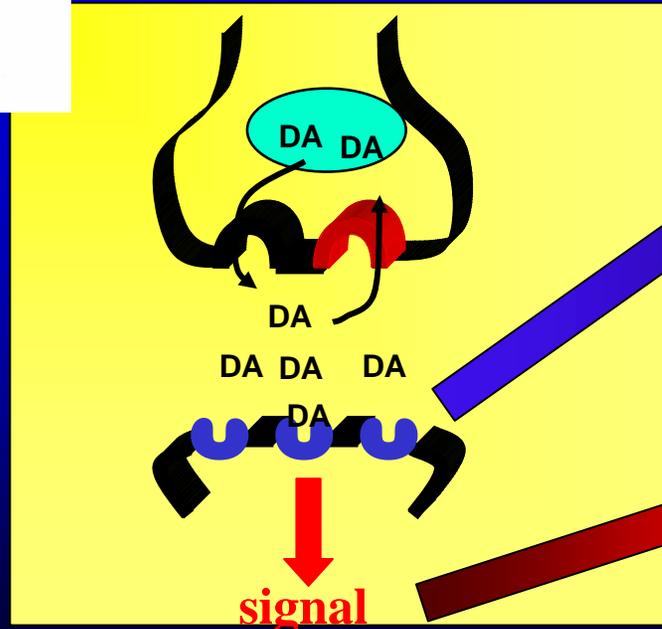
Anatomy



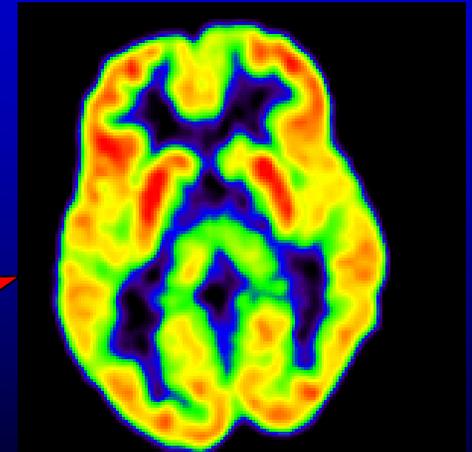
DA Transporters



DA Receptors



Dopamine Cell

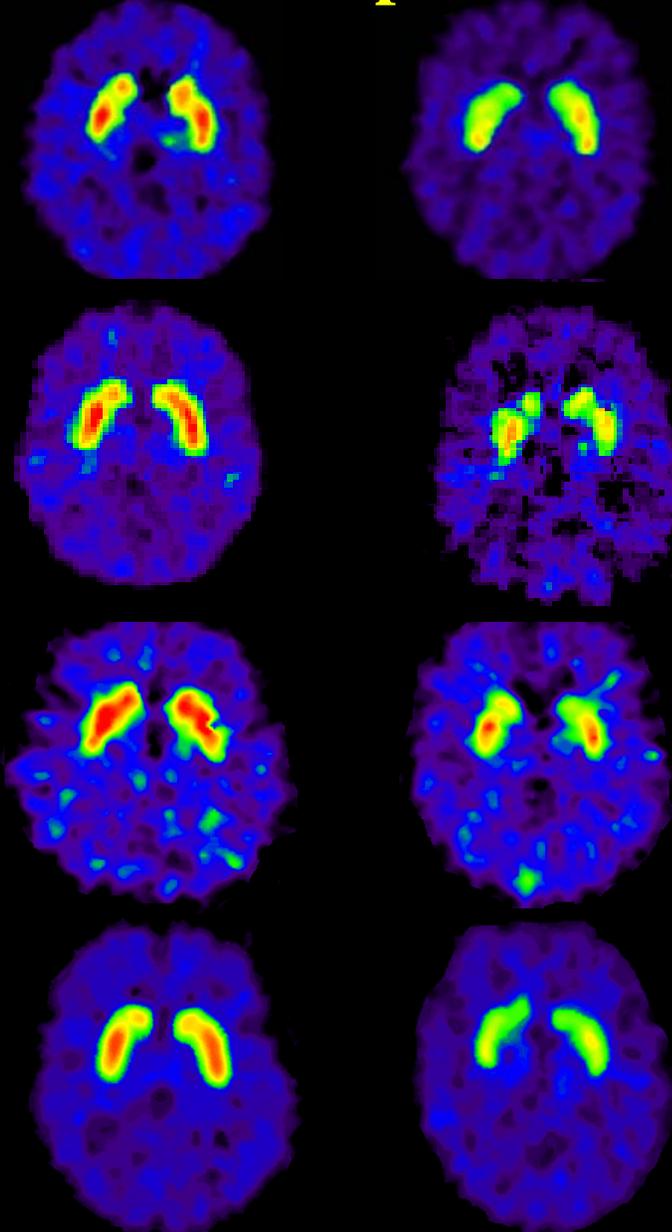
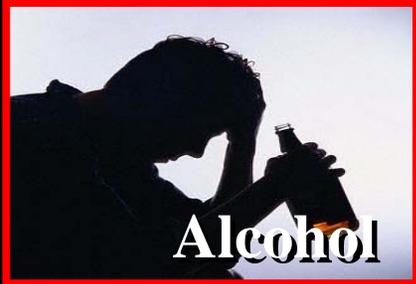


Metabolism

A colorful, abstract brain scan image, possibly a PET or SPECT scan, showing a cross-section of a brain. The image is dominated by a central crosshair pattern in shades of red and orange, surrounded by a blue and green ring. The background is a dark blue gradient. The text is centered over the image.

**Drug
Addiction
is a
Treatable
Brain
Disease**

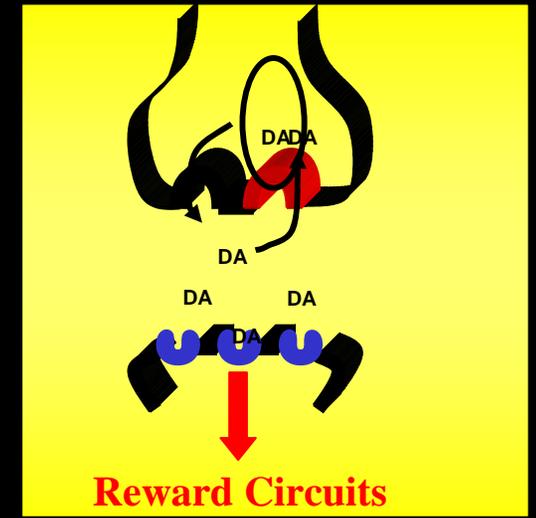
Dopamine D2 Receptors are Lower in Addiction



↑
DA D2 Receptor Availability

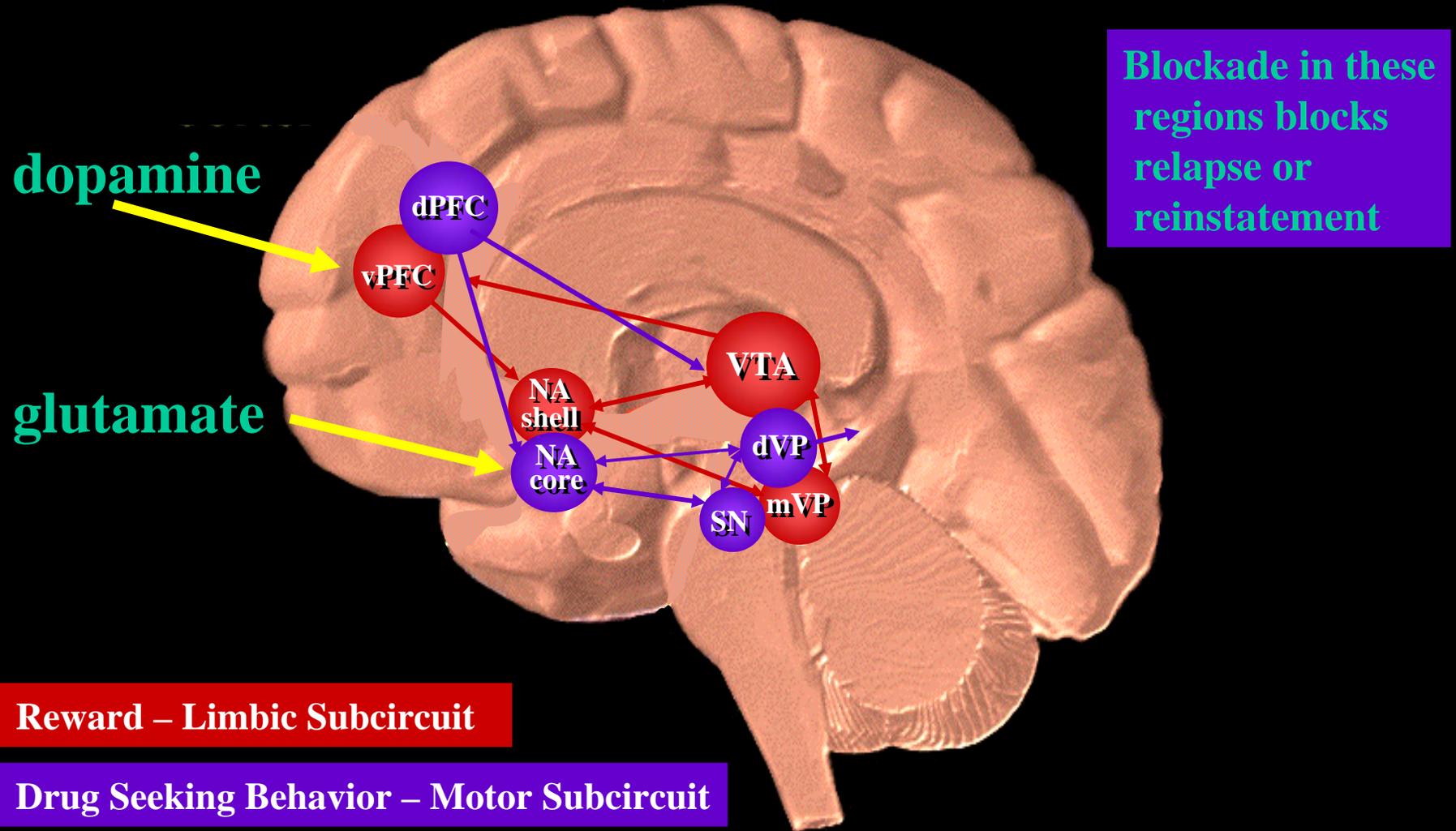


Non-Drug Abuser

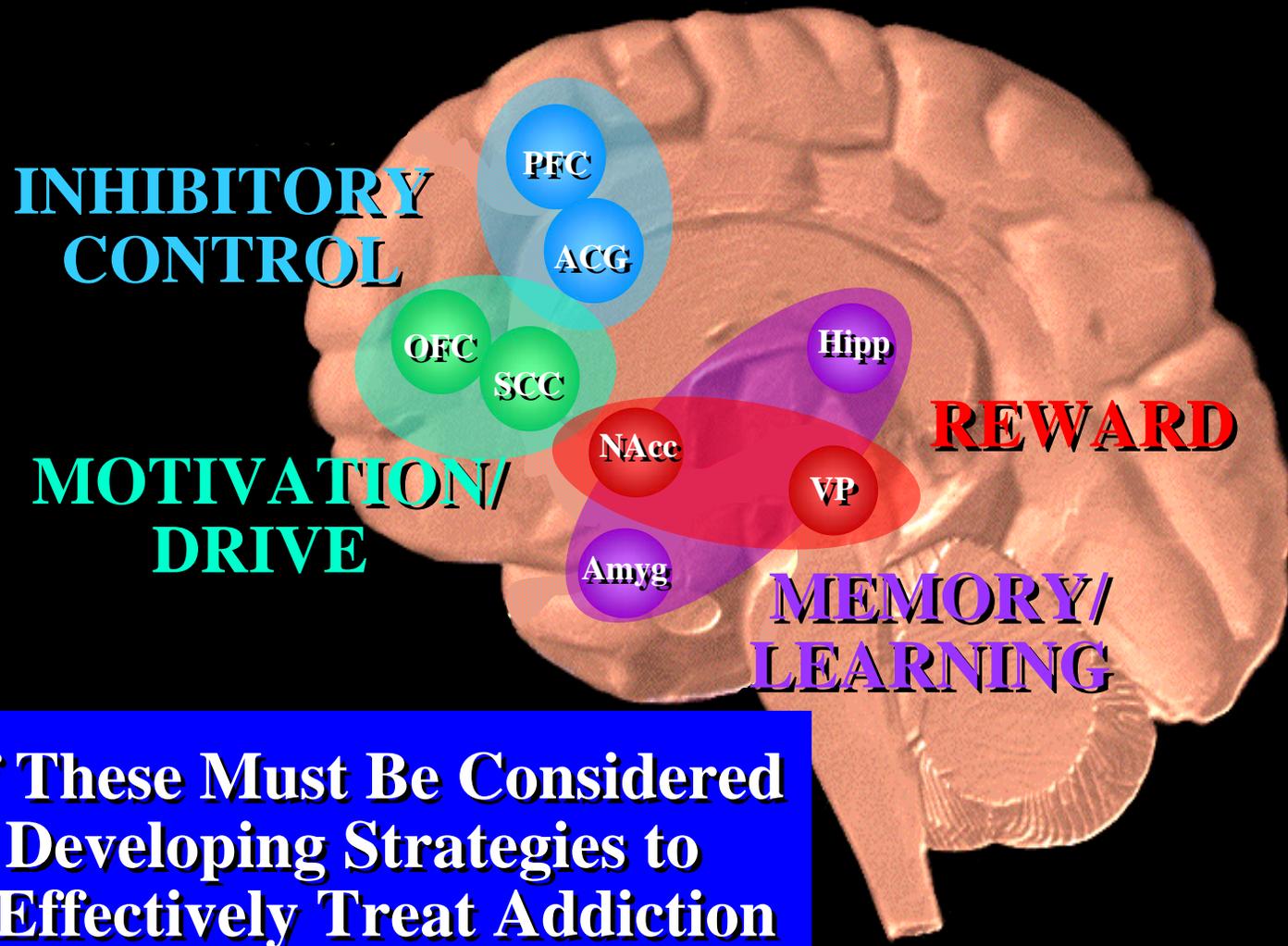


Drug Abuser

Different Brain Circuitry Involved in Drug Reward and Drug Persistence Behavior



Circuits Involved In Drug Abuse and Addiction

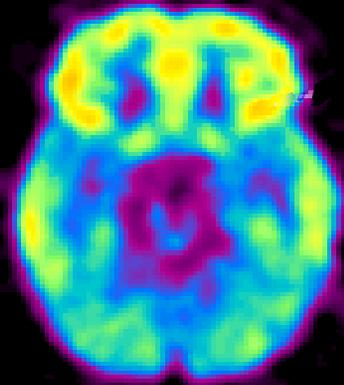


**All of These Must Be Considered
In Developing Strategies to
Most Effectively Treat Addiction**

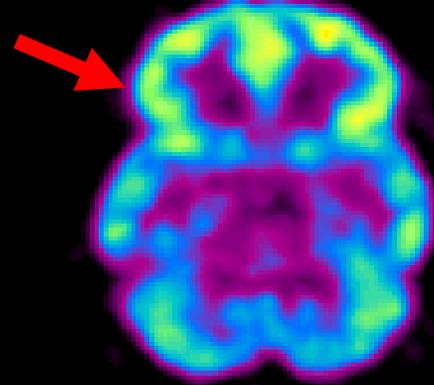
ADDICTION IS A DISEASE OF THE BRAIN

like other diseases, it affects tissue function

Decreased Brain Metabolism in *Drug Abuse Patient*



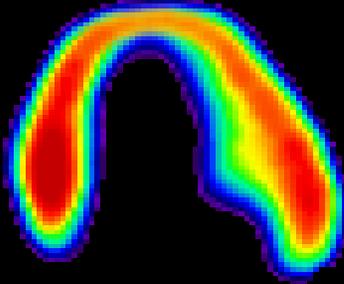
Control



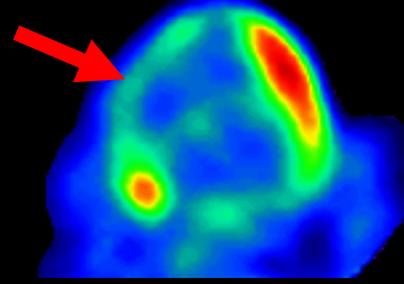
Cocaine Abuser



Decreased Heart Metabolism in *Heart Disease Patient*

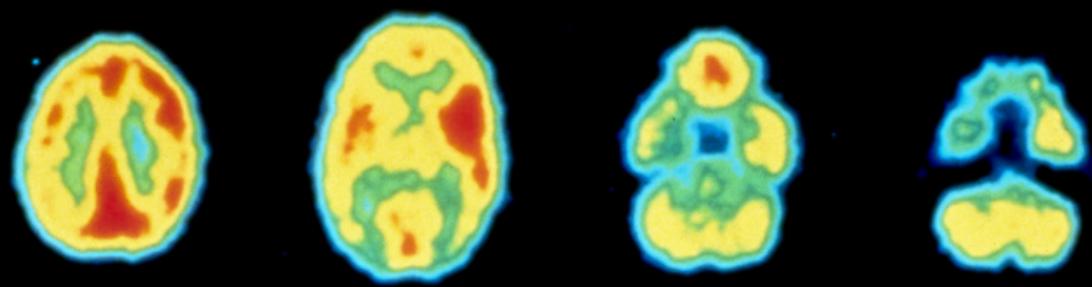


Healthy Heart

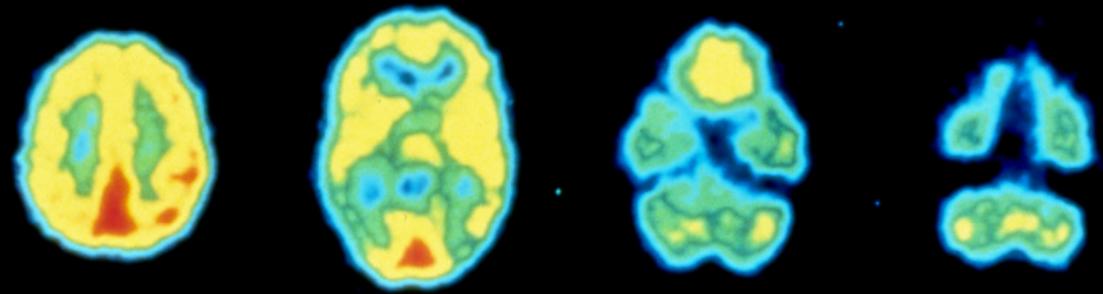


Diseased Heart

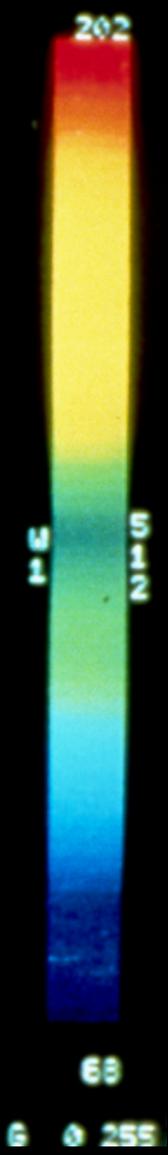
Sources: From the laboratories of Drs. N. Volkow and H. Schelbert

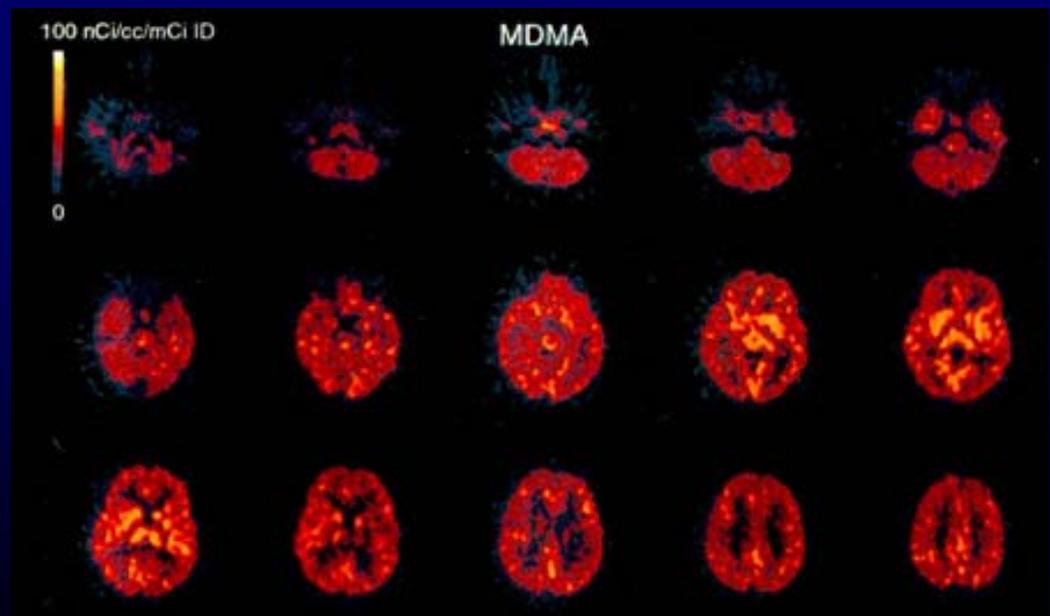
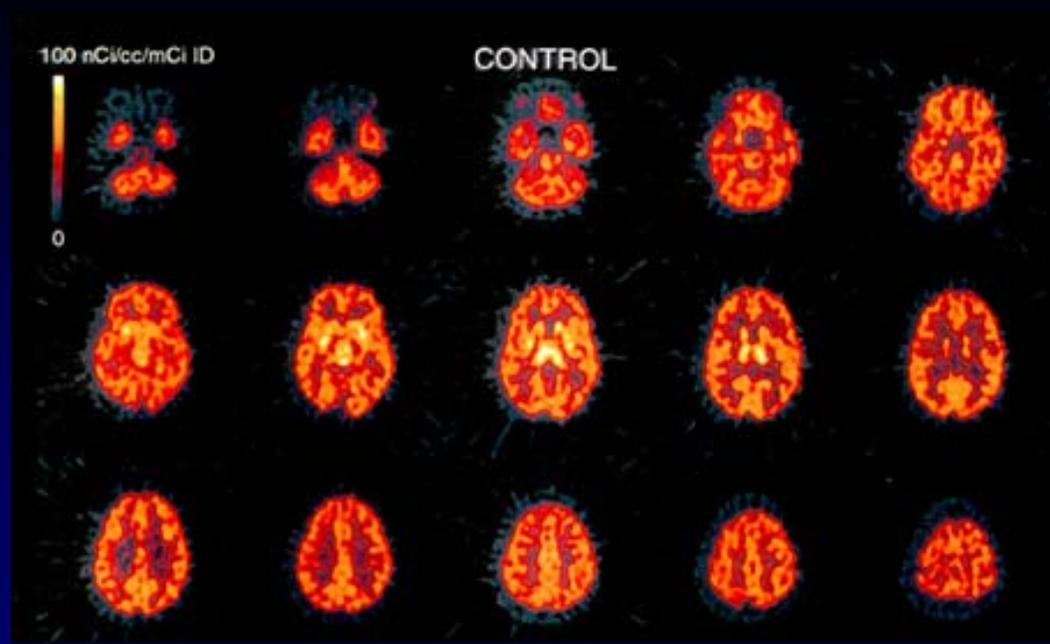


NORMAL



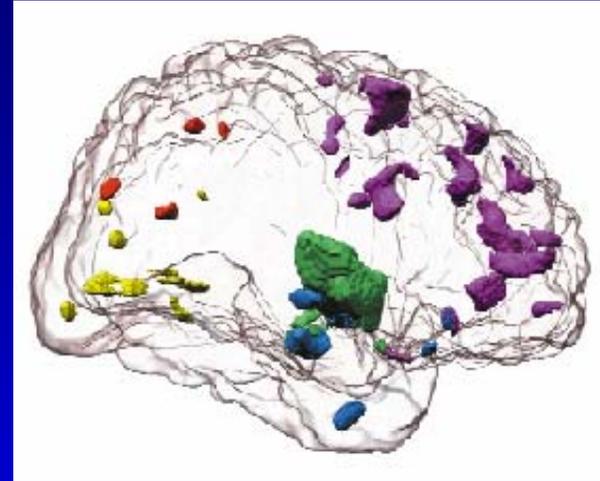
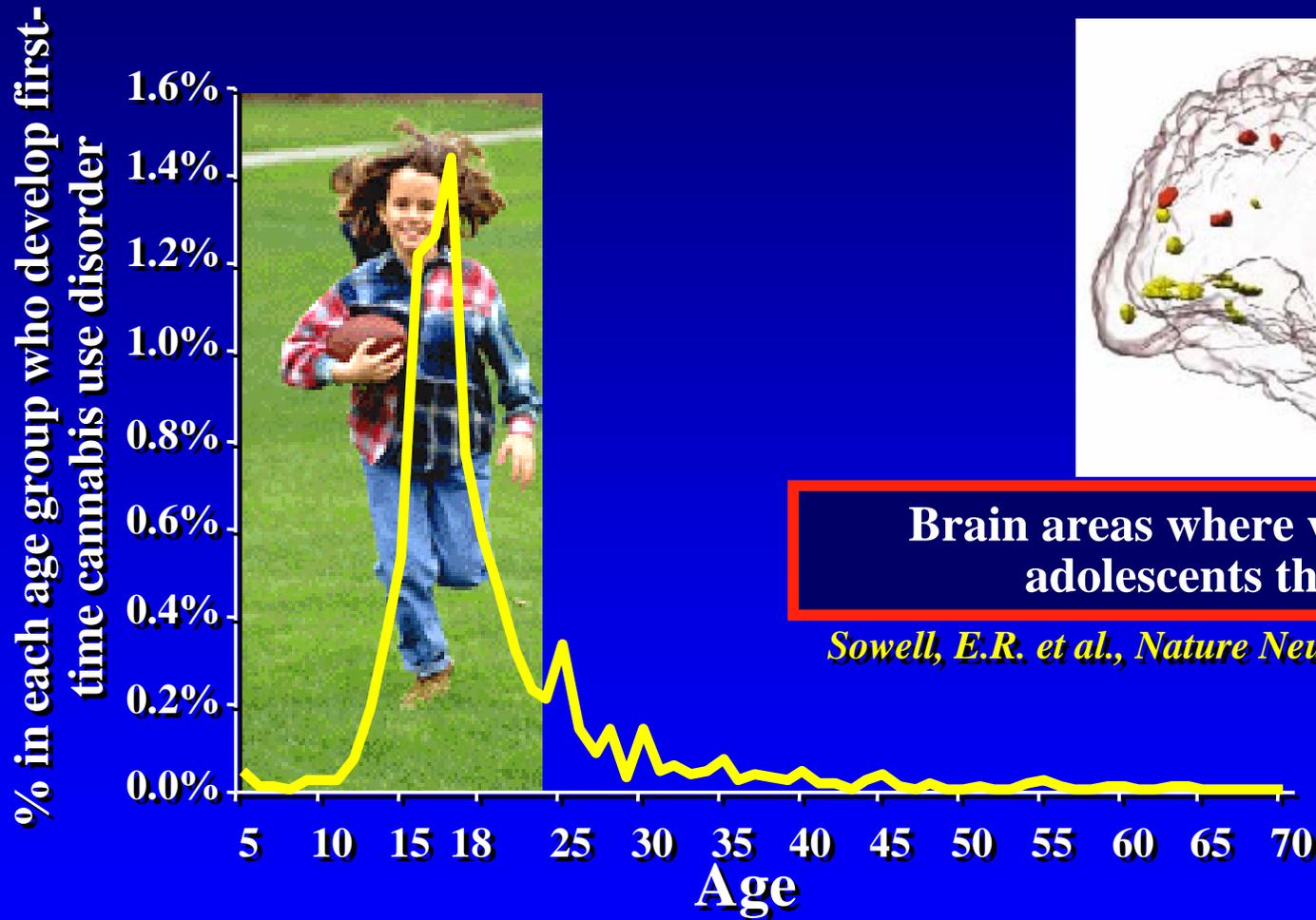
MARIJUANA ABUSER





**Chronic use of some of these drugs
may alter the way the brain functions,
making persons particularly
susceptible to mental illness**

ADDICTION IS A DEVELOPMENTAL DISEASE *starts in adolescence and childhood*



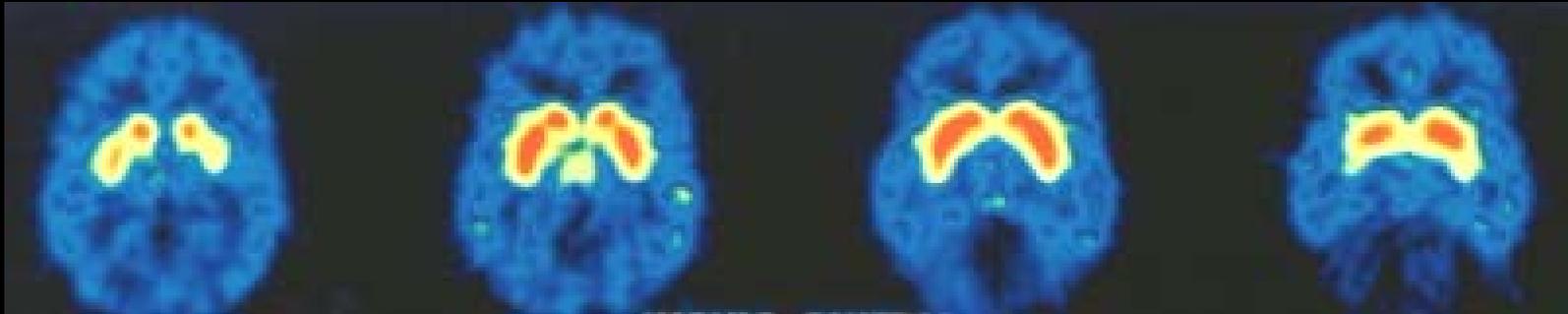
Brain areas where volumes are smaller in adolescents than young adults.

Sowell, E.R. et al., Nature Neuroscience, 2: 859-861, 1999

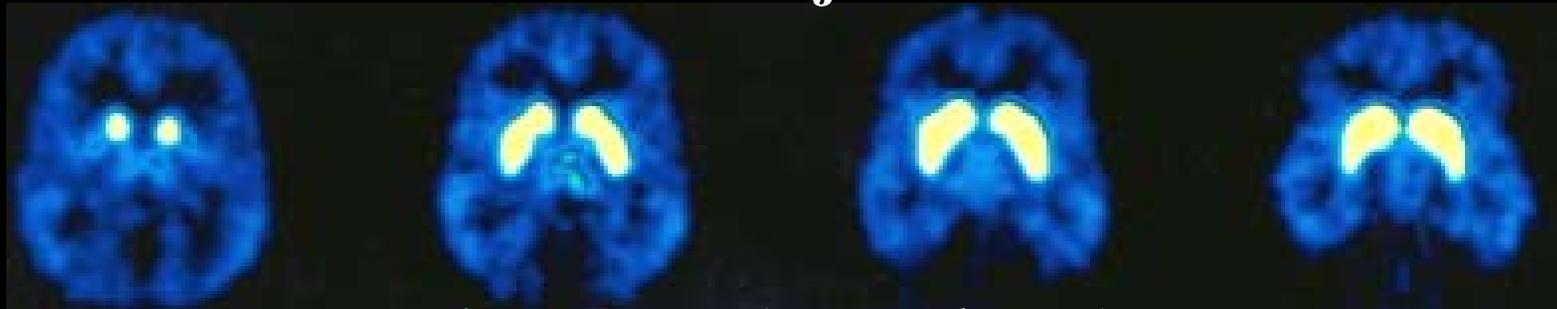
Age at cannabis use disorder as per DSM IV

NIAAA National Epidemiologic Survey on Alcohol and Related Conditions, 2003

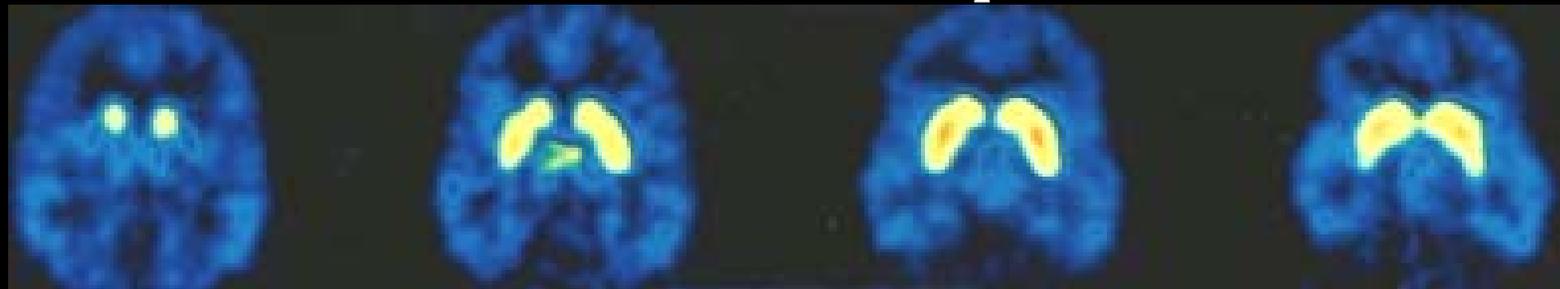
Effect of Cocaine Abuse on Dopamine D2 Receptors



normal subject



cocaine abuser (*1 month post*)



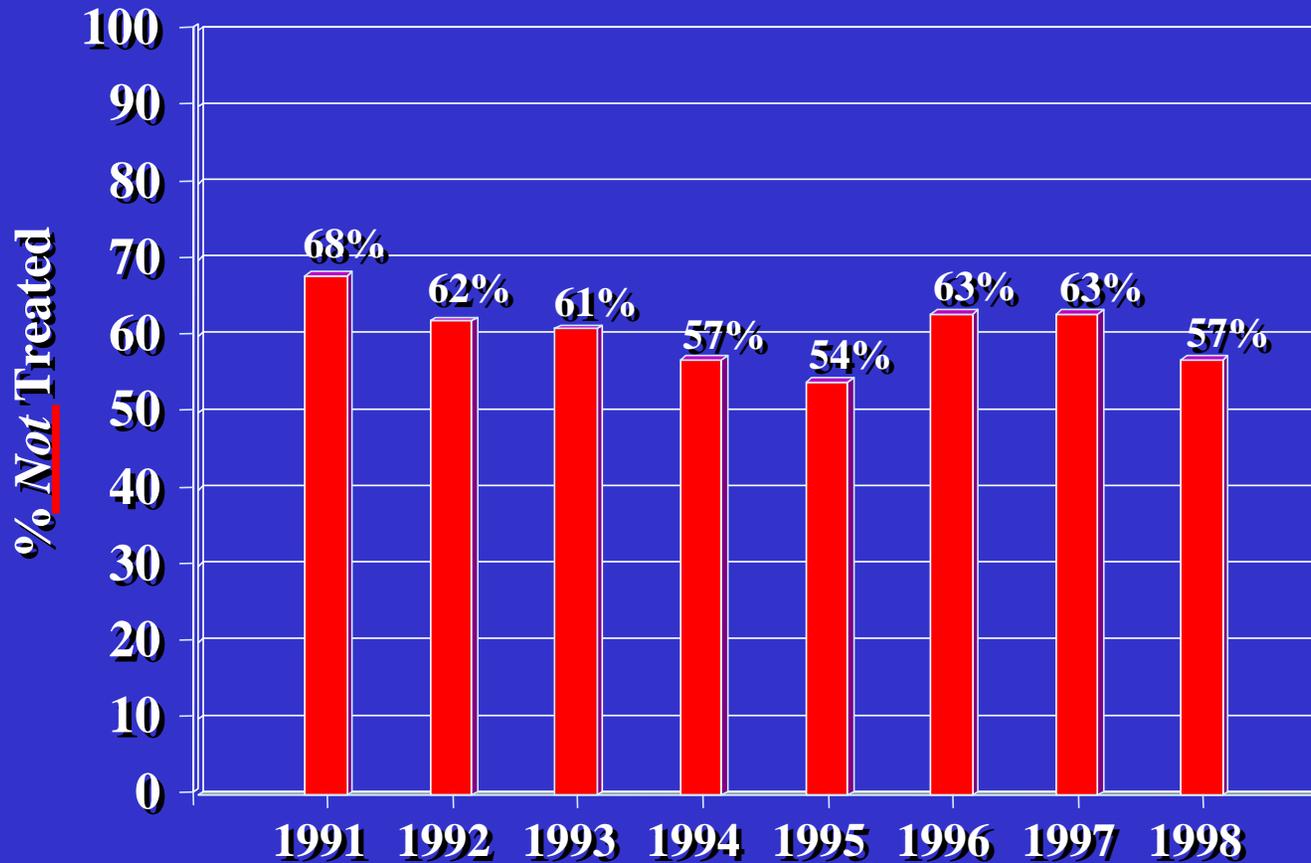
cocaine abuser (*4 months post*)



Research Tells Us That **STRESS
Can Be A Major Factor In the
*Initiation of Drug Use...***

**And One of the Most
Powerful Triggers
for *Relapse* In Recovering Addicts...**

The Majority of People Who Need Treatment for Drug Abuse Problems Don't Receive It!



Source: OAS, SAMHSA. Unpublished Data from the National Household Survey on Drug Abuse and Uniform Facility Data Set (1991-1998) – in National Drug Control Strategy 2000 Annual Report Table 39, p. 140.

National Comorbidity Survey (NCS)

- **Nearly half** of individuals with a **past year** substance use disorder also had a mental disorder
- Mental disorders found to be **most prevalent** included **affective** disorders, **anxiety** disorders, **personality** disorders, and **psychotic** disorders

**DRUG ABUSE AND ADDICTION
INVOLVE
MULTIPLE AND INTERACTIVE FACTORS**

