

# Addiction as a Brain Disease: Use of Medications in the Clinical Setting

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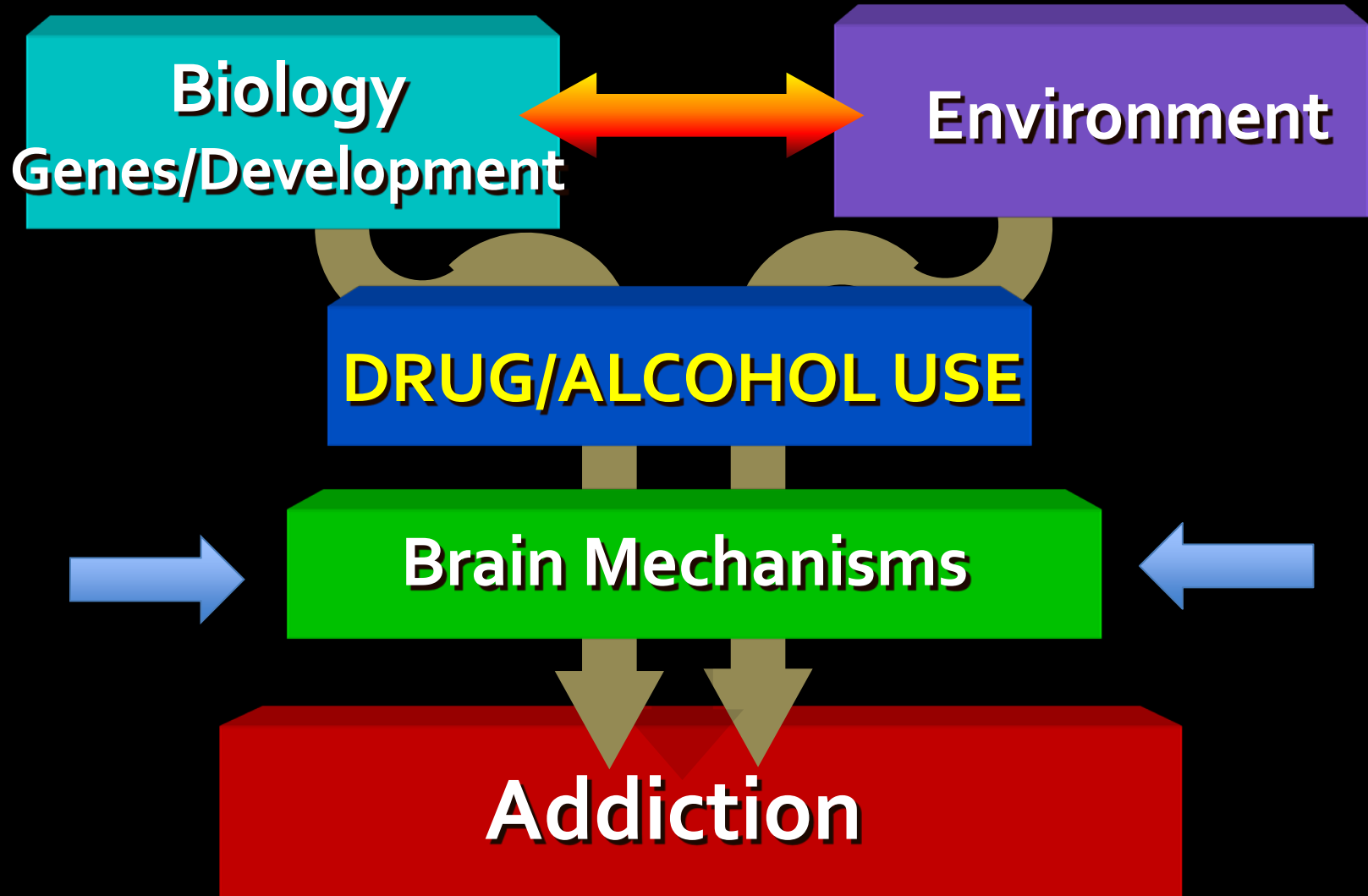
National Institutes of Health

Department of Health and Human Services

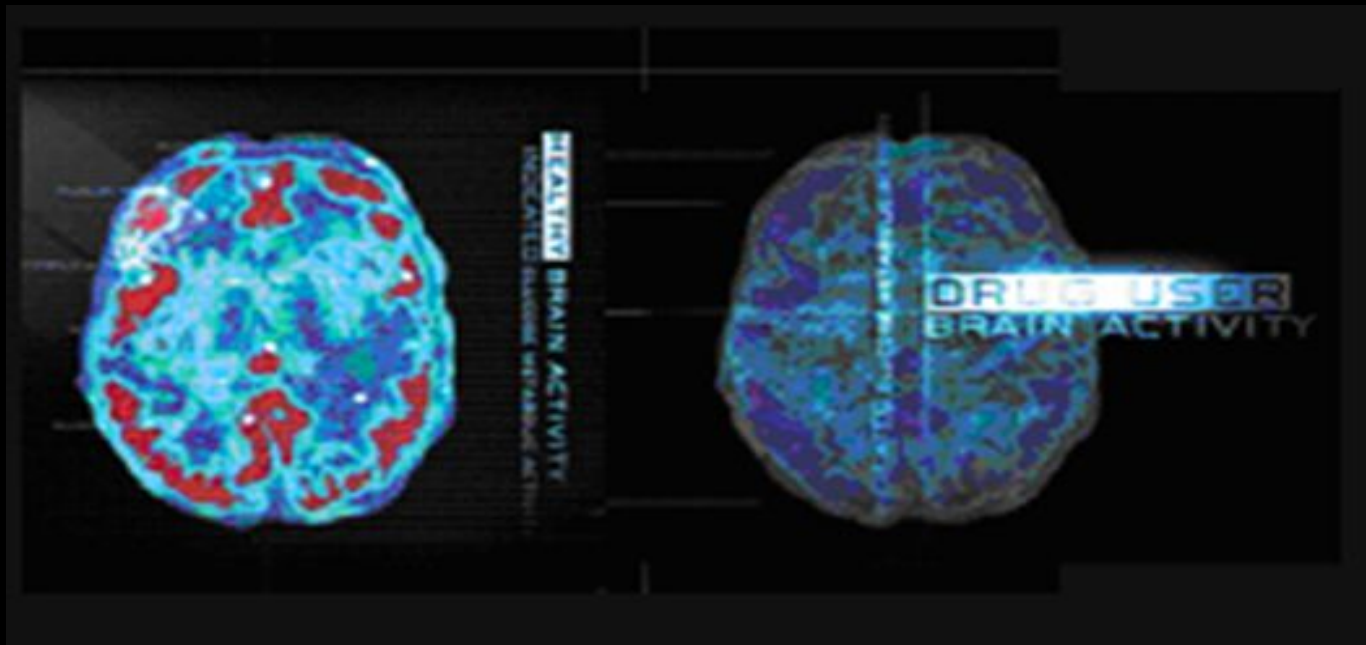
# Why Do People Become Addicted to Drugs?



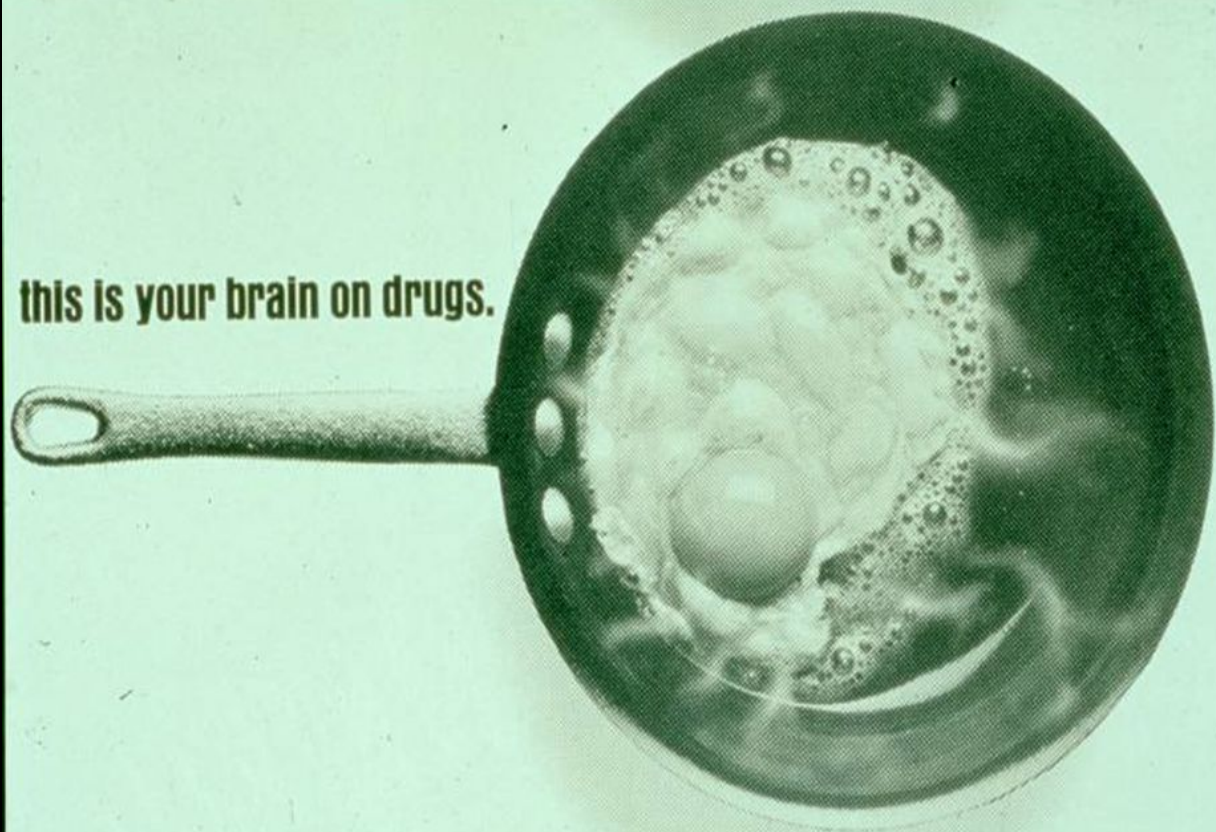
# Development of Addiction Involve Multiple Factors



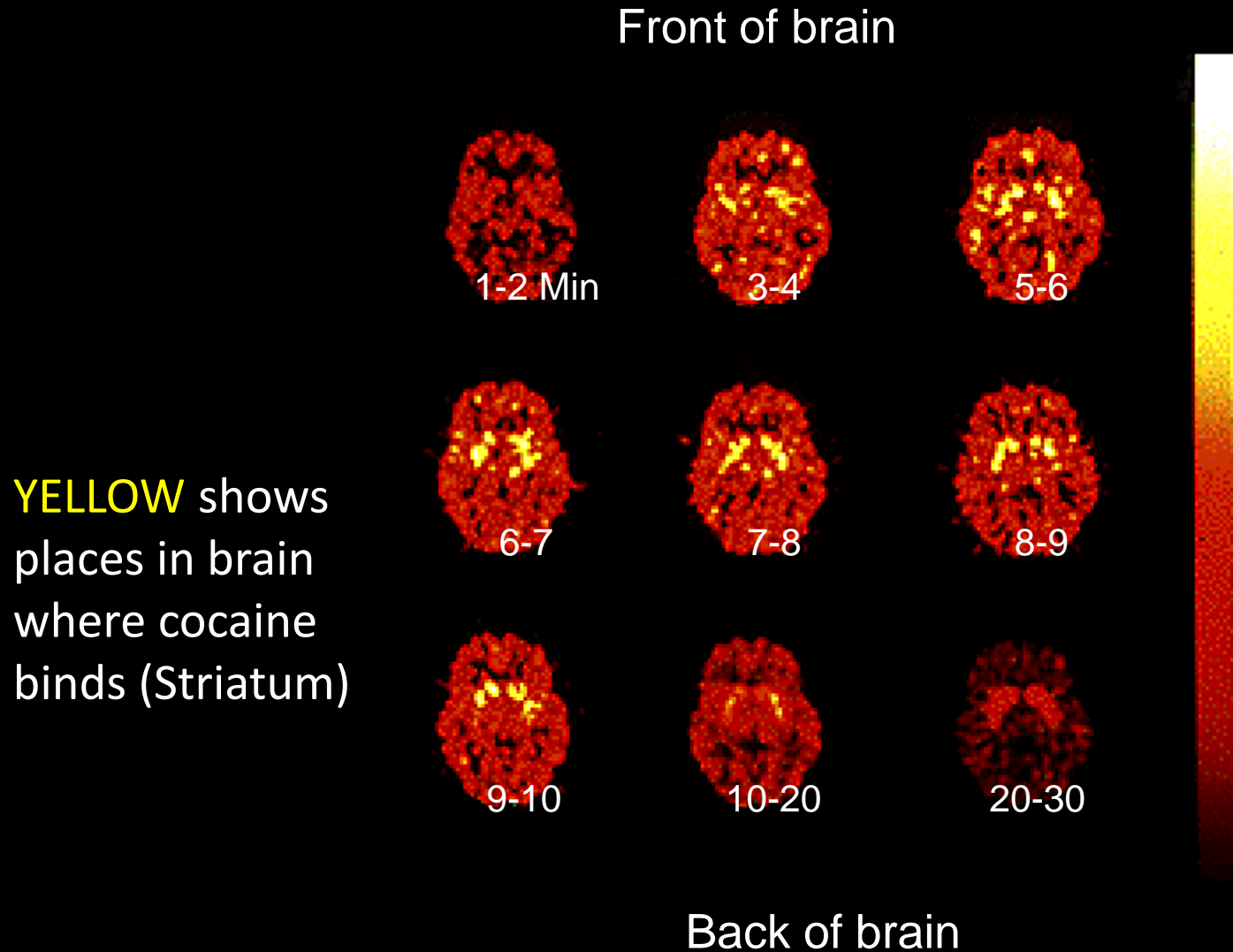
**Advances in neuroscience have revolutionized our fundamental understanding of addiction**



**this is your brain on drugs.**

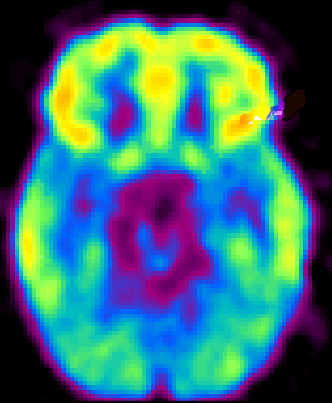


# The Brain on Drugs

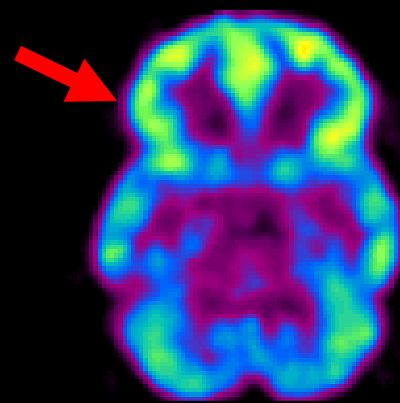


# Addiction: A Disease of the Brain

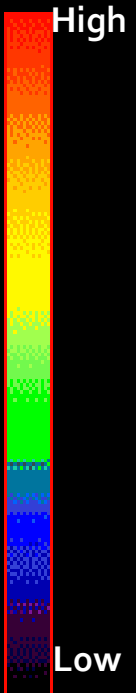
Decreased Brain Metabolism in *Substance Use Disorder Patient*



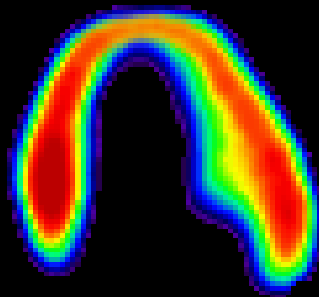
Control



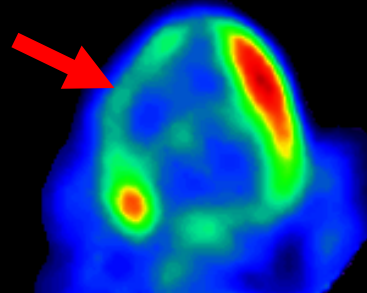
Cocaine Abuser



Decreased Heart Metabolism in *Heart Disease Patient*



Healthy Heart

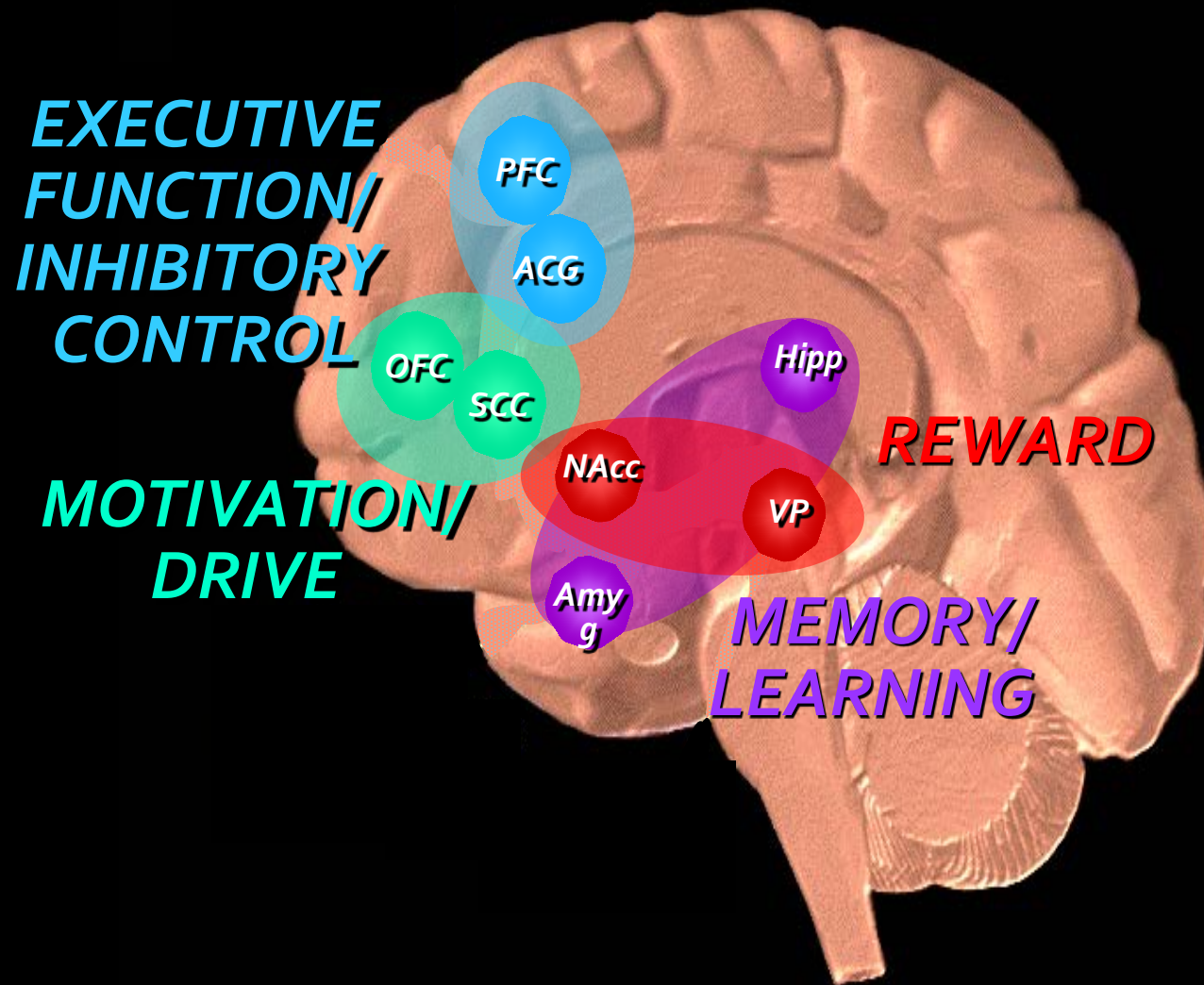


Diseased Heart

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



# Brain Circuits Involved In Addiction

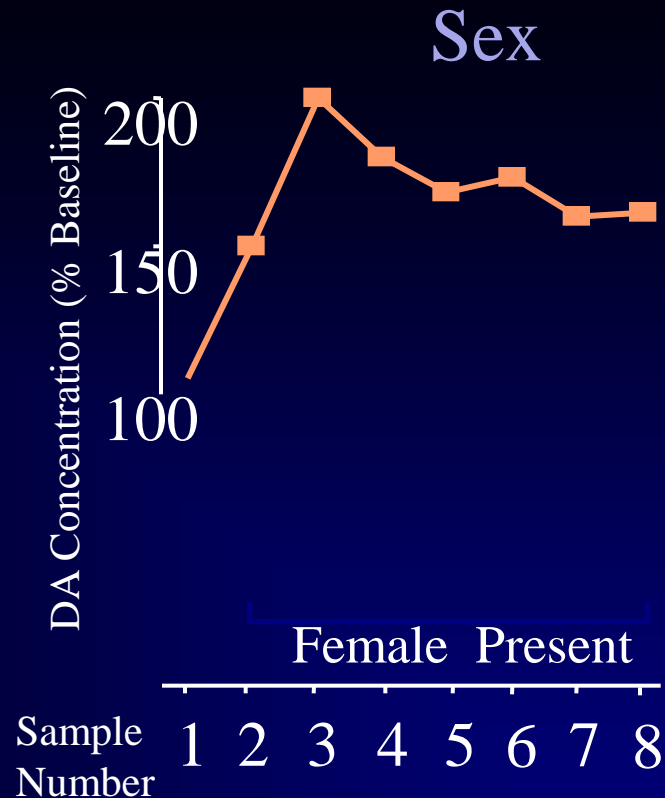
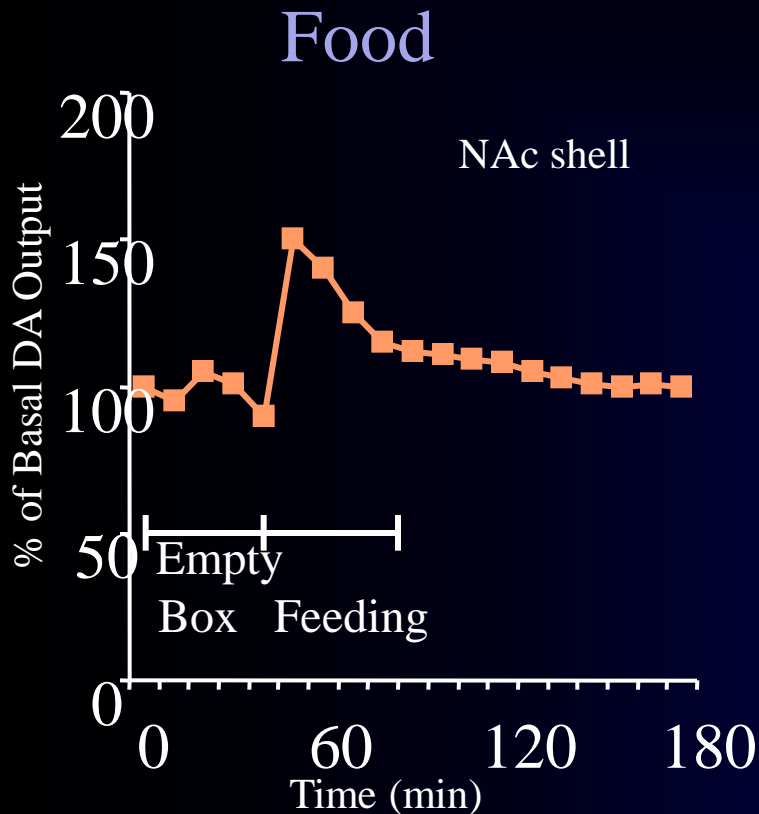




# 1. *Reward Circuit*

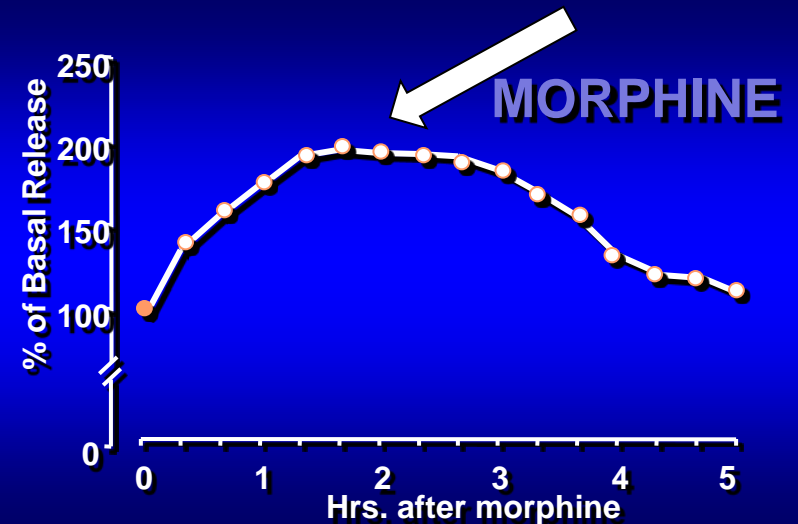
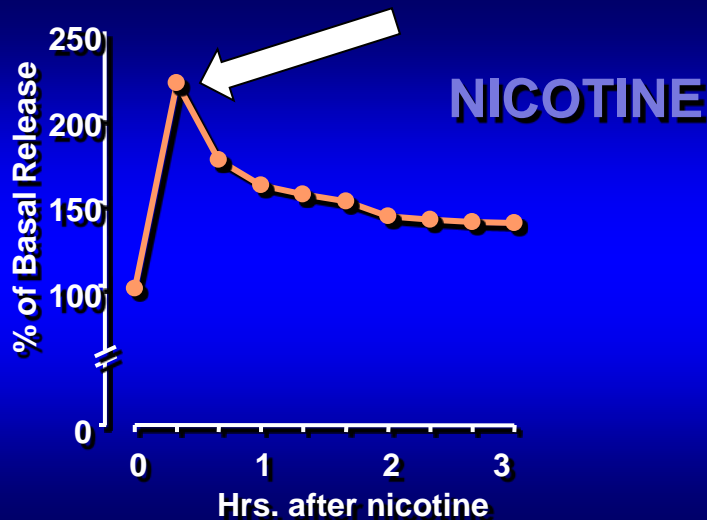
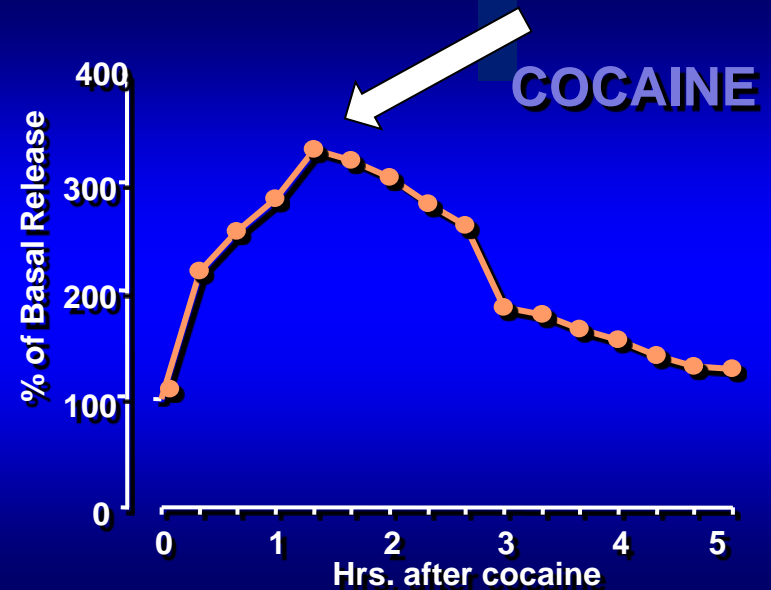
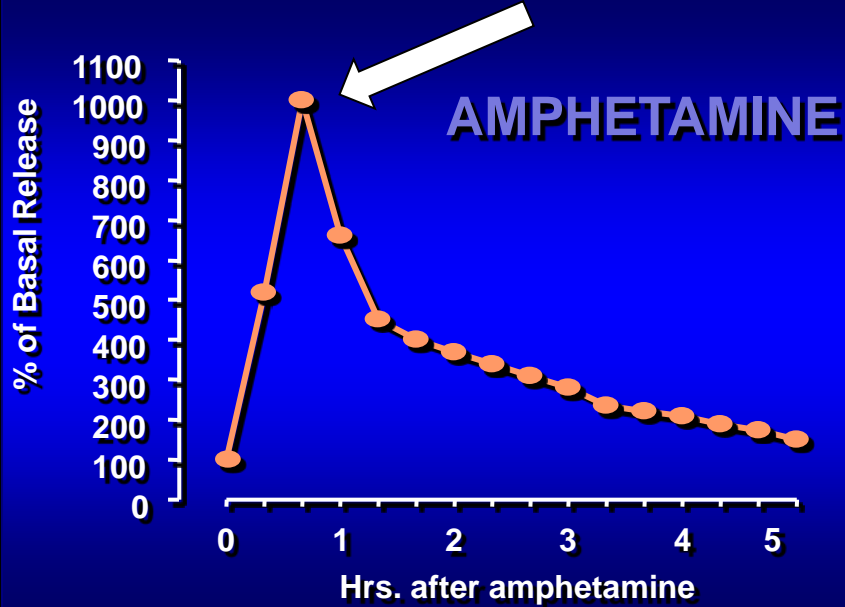


# Natural Rewards Elevate Dopamine Levels

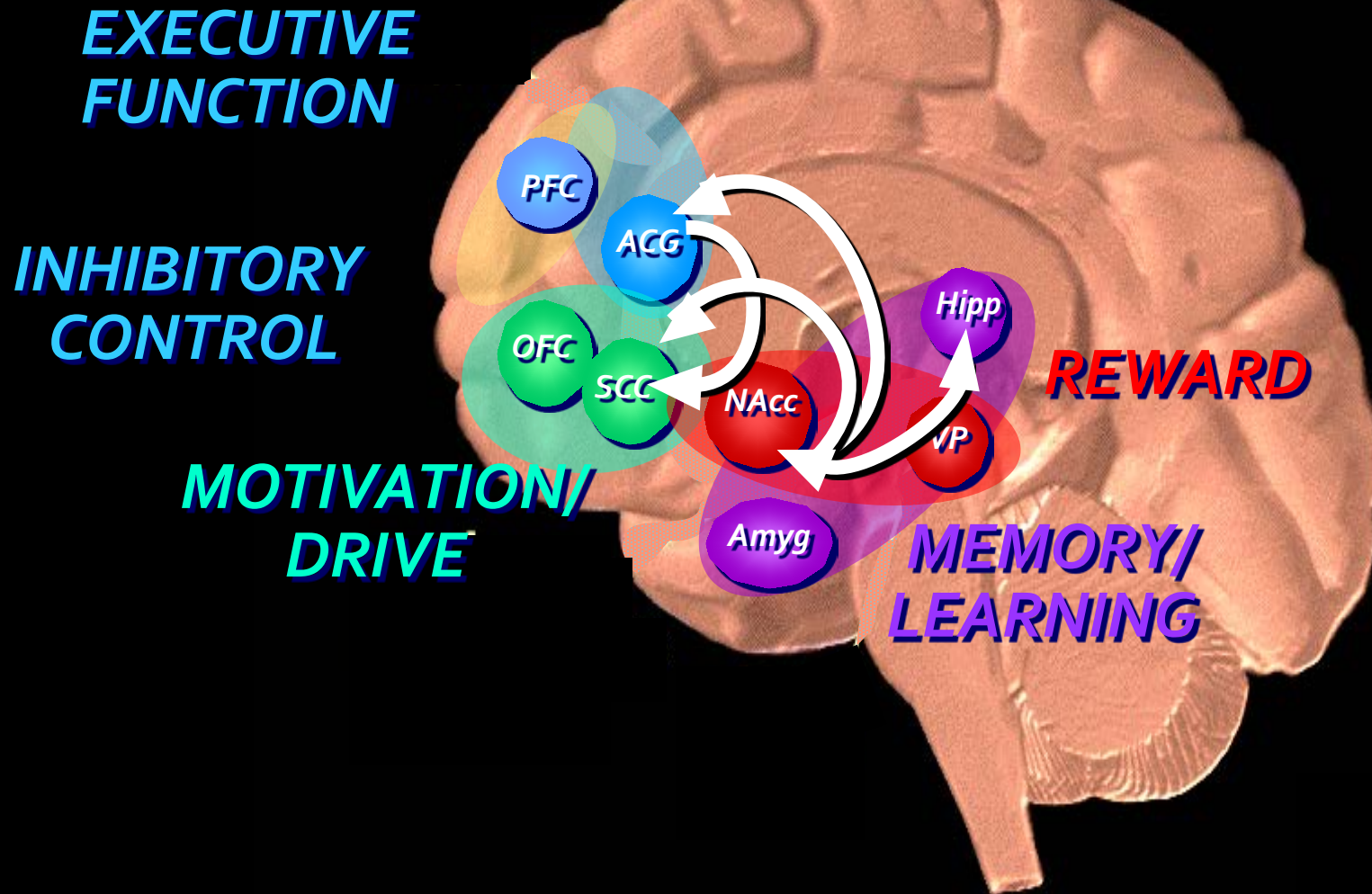


Di Chiara et al., Neuroscience, 1999., Fiorino and Phillips, J. Neuroscience, 1997.

# Drugs Elevate Dopamine Levels More/Longer



# Balance in Brain Systems Severely Disrupted in Addiction



# Addiction Medications

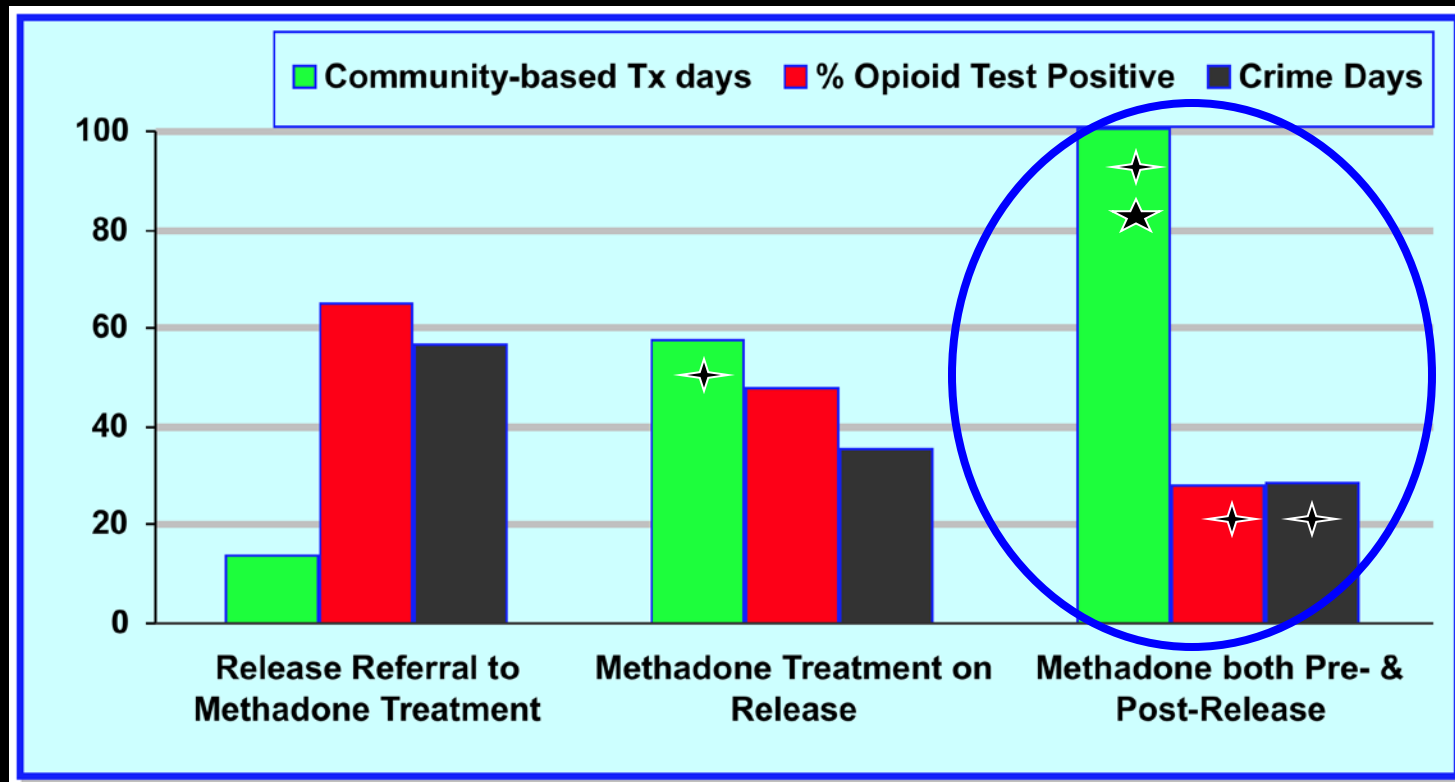
- **Opiates**
  - Methadone
  - Buprenorphine
  - Naltrexone
- **Alcohol**
  - Acomprosate
  - Disulfiram
  - Naltrexone
- **Nicotine**
  - Nicotine replacement products
  - Bupropion
  - Varenicline

# Low Uptake of Pharmacotherapy in Specialty Programs in 2007

	As % of all programs surveyed (N=345)	Within adopting programs, % of eligible patients receiving Rx
<u>Psychiatric meds</u>	54.5	70.1
<u>Opioid tx meds:</u>		
Methadone	7.8	41.3
Buprenorphine	20.9	37.3
Tablet naltrexone	22.0	10.9
<u>Alcohol meds:</u>		
Disulfiram	23.8	8.1
Tablet naltrexone	32.2	12.4
Acamprosate	32.5	17.5
Injectable naltrexone	15.9	(too new to report)

# Addiction Medication Use in the Criminal Justice System

Methadone Study: 6 Mo Post Release (N=201)



✦-- signif. diff from referral

★-- signif. diff from treatment only on release

Source: Gordon, M.S., Kinlock, T.W., Schwartz, R.P., O'Grady, K.E. (2008). *Addiction. A Randomized Clinical Trial of Methadone Maintenance for Prisoners: Findings at 6-Months Post-Release.*



# Advances in Medication Development

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- **Addiction Vaccines**

- Nicotine, cocaine\*, heroin, methamphetamine

- **Long-Acting Forms**

- Vivitrol (injectable naltrexone)
- Probuphine (buprenorphine implant)

- **Medication Combinations**

- Cocaine, marijuana

Thanks!

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