

HEROIN AND OTHER OPIOIDS ON CAMPUS

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Heroin=Diacetylmorphine: All Opioids Can Be Used This Way

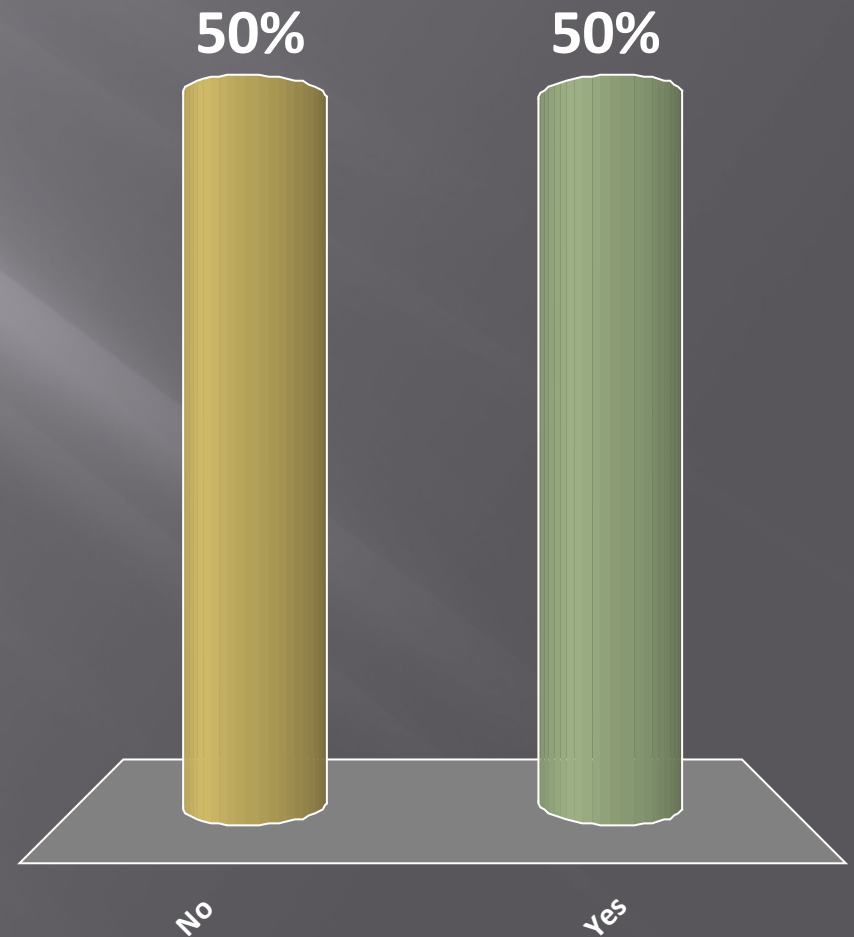
- ▣ Receptors: Mu, Delta, Kappa, Nociceptin
- ▣ Mu agonist goal of use
- ▣ Routes of administration
 - Eating
 - Sniffing
 - Injection
 - Smoking

Definition of “Addiction”

- ▶ REPEATED
 - ▶ HARM
 - ▶ FROM
 - ▶ X
-
- ▶ The addicted person urgently wants the drug, even while they know it is hurting them

Is Coffee Addicting?

- A. No
- B. Yes



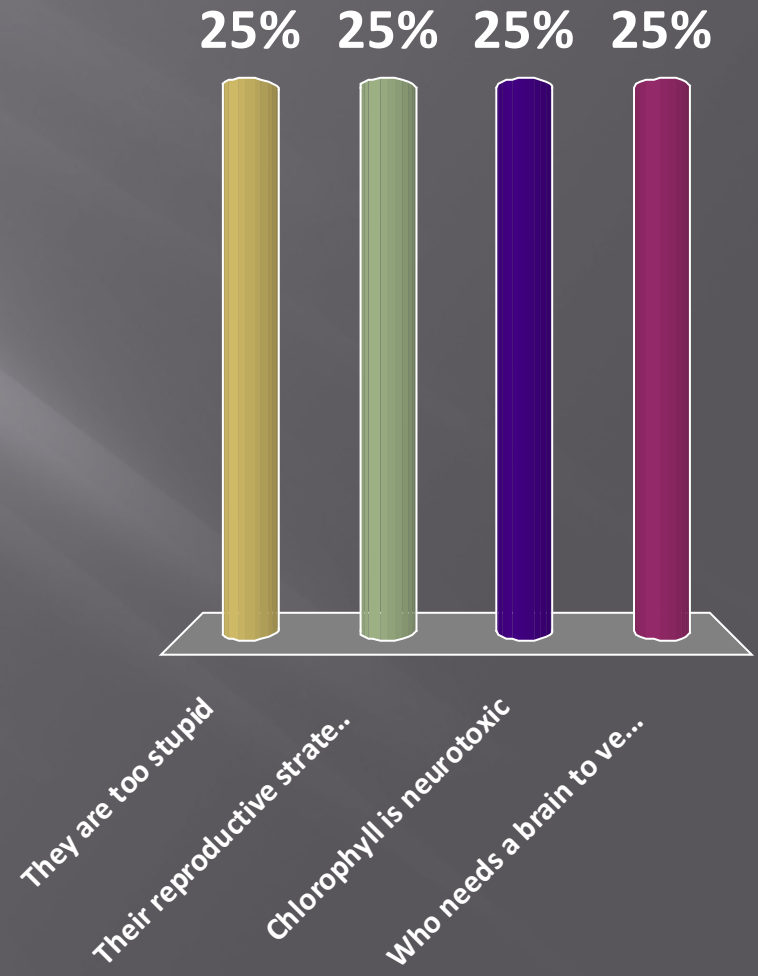


Kalivas & Volkow 2005

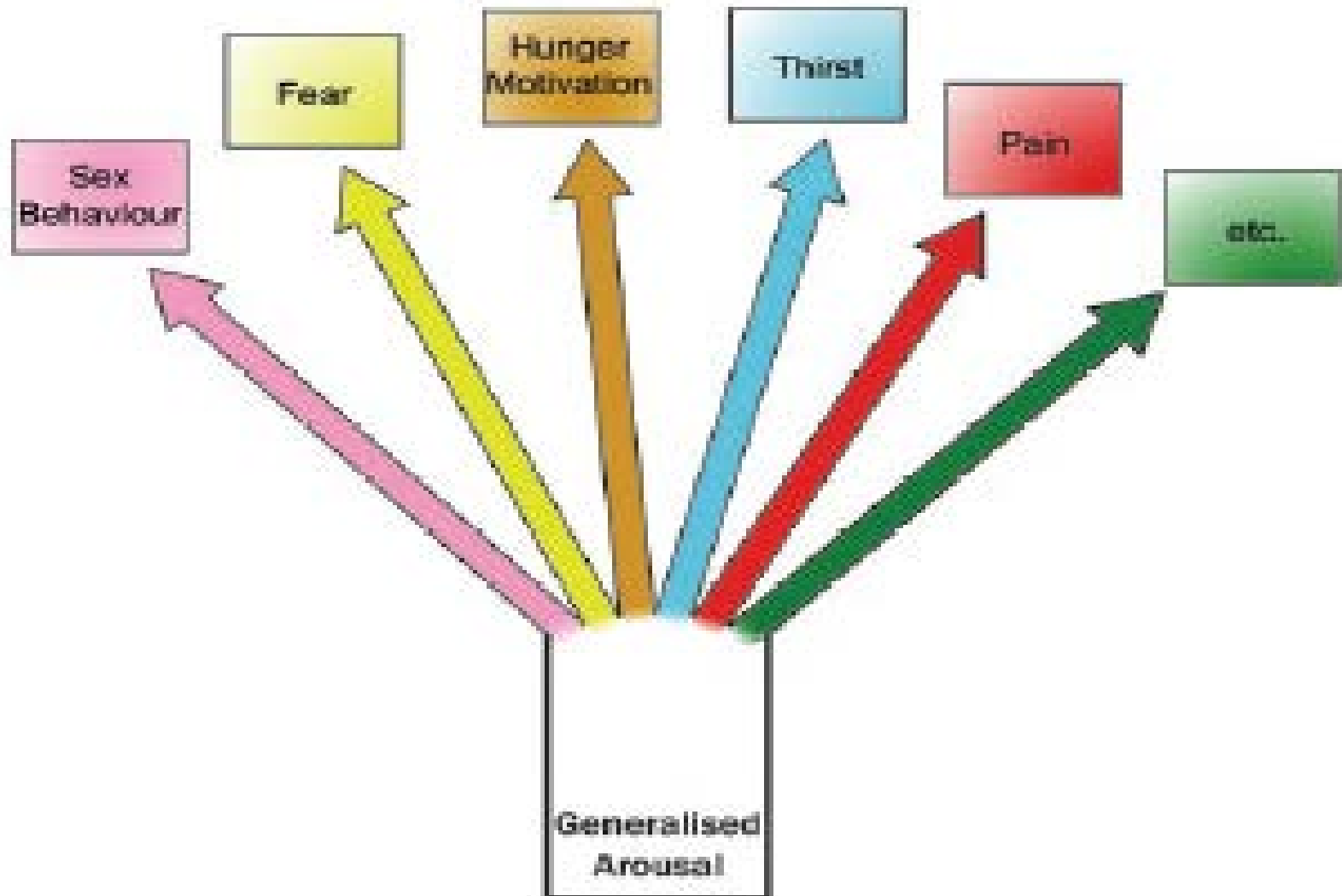
“As the pursuit for the neural basis of addiction advances, it is clear that the search intimately involves understanding the neurobiological basis of motivation, and choice for biological reward, such as food and sex, as well as more cognitively and experimentally based reward such as friendship, family and social status.”

Why Don't Plants Have Brains?

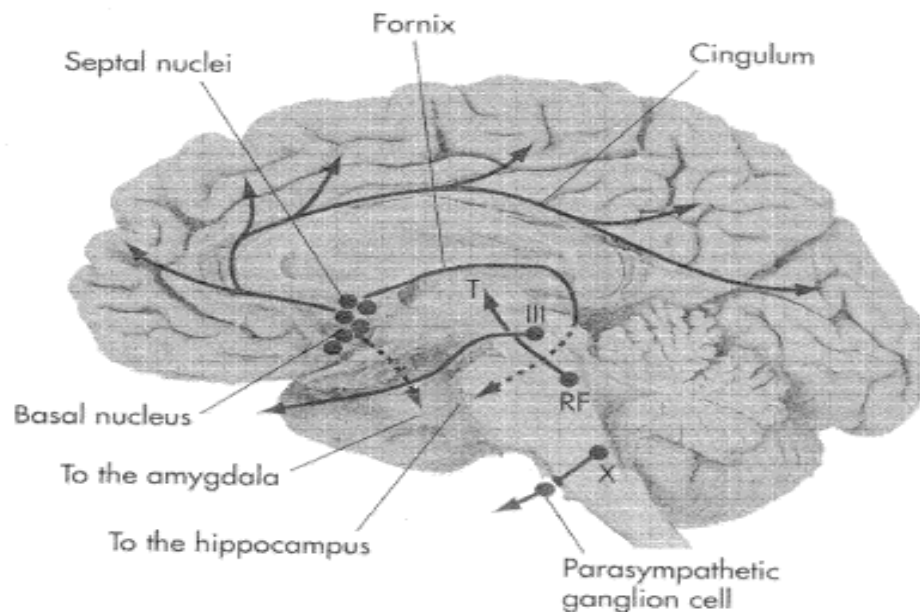
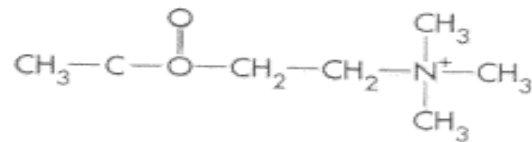
- A. They are too stupid
- B. Their reproductive strategy requires no brain
- C. Chlorophyll is neurotoxic
- D. Who needs a brain to vegetate?



THE BRAIN HAS DRIVE SYSTEMS

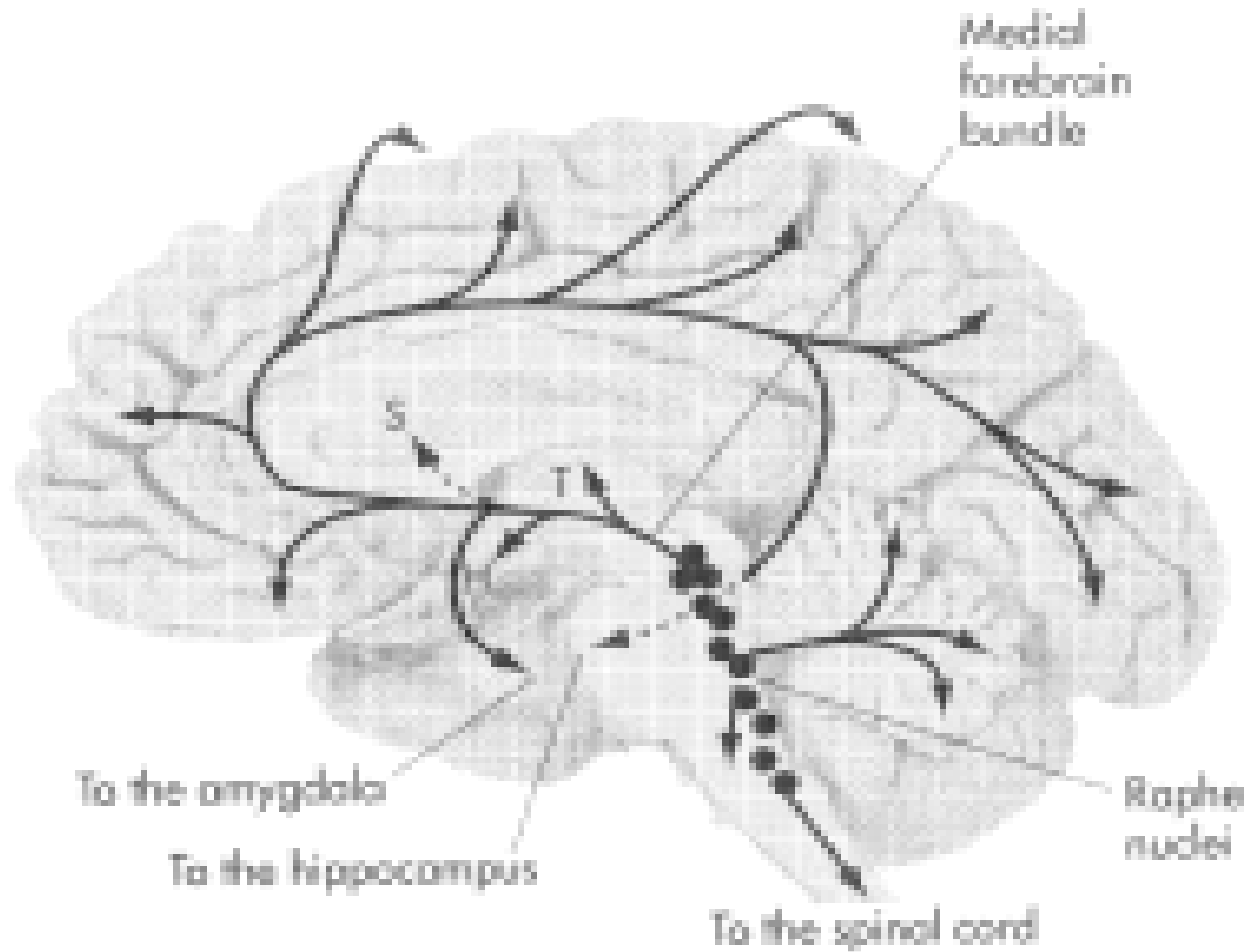


ACETYLCHOLINE

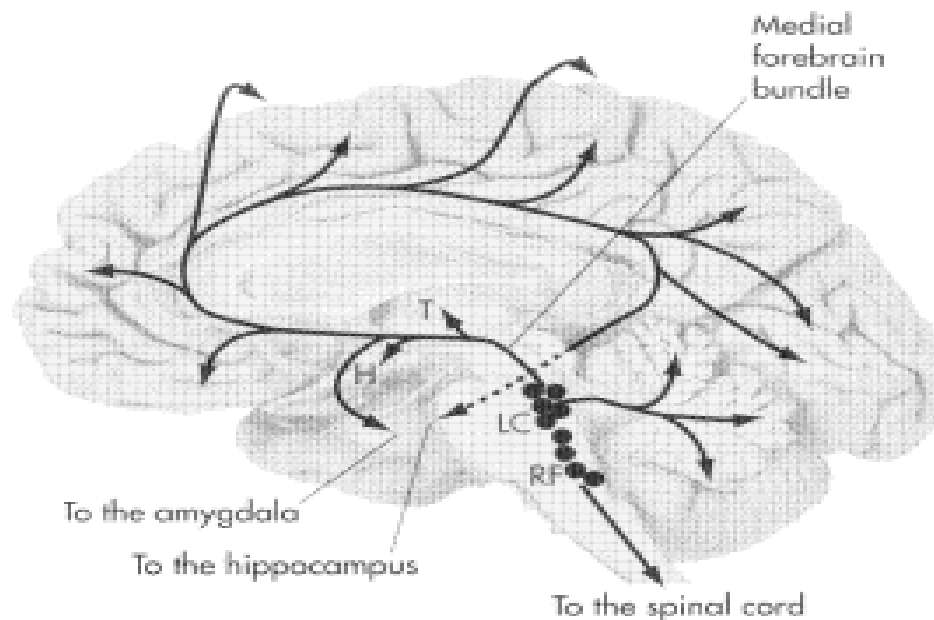
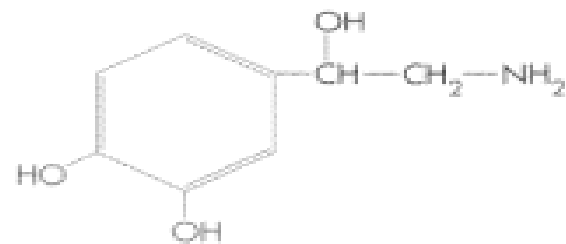


III, oculomotor nucleus (representing motor neurons in general)
X, dorsal motor nucleus of the vagus (representing preganglionic autonomic neurons in general)
RF, reticular formation
T, thalamus

SEROTONIN

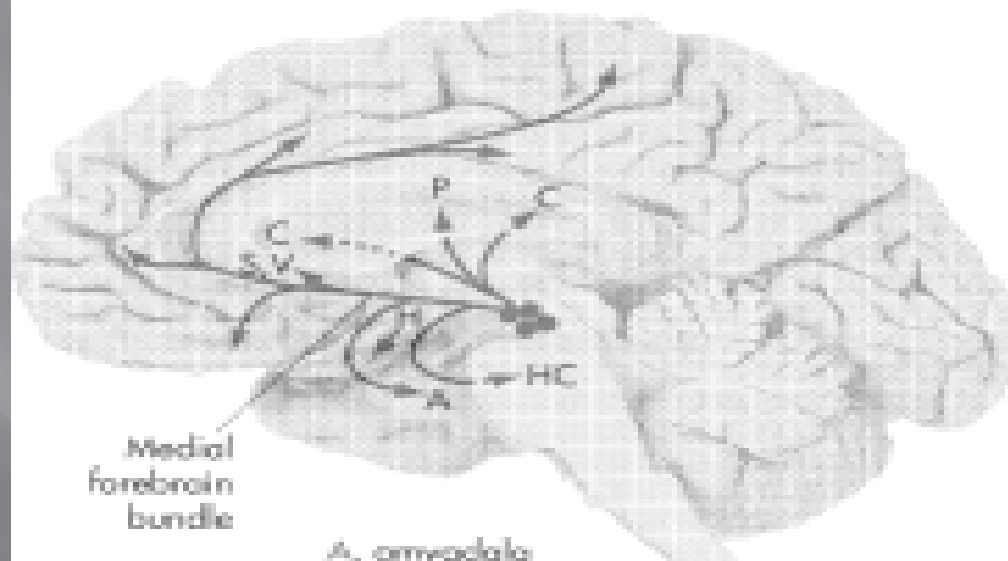
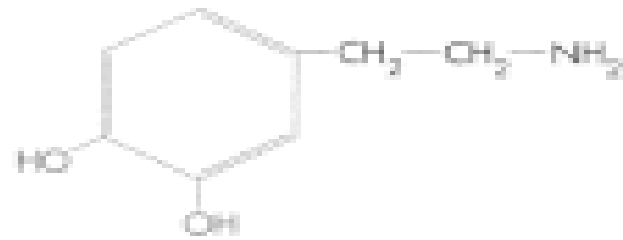


NOREPINEPHRINE



H, hypothalamus
LC, locus ceruleus
RF, reticular formation
T, thalamus

DOPAMINE



Medial
forebrain
bundle

A, amygdala
C, caudate nucleus
H, hypothalamus
HC, hippocampus
P, putamen
S, septal nuclei
V, ventral striatum

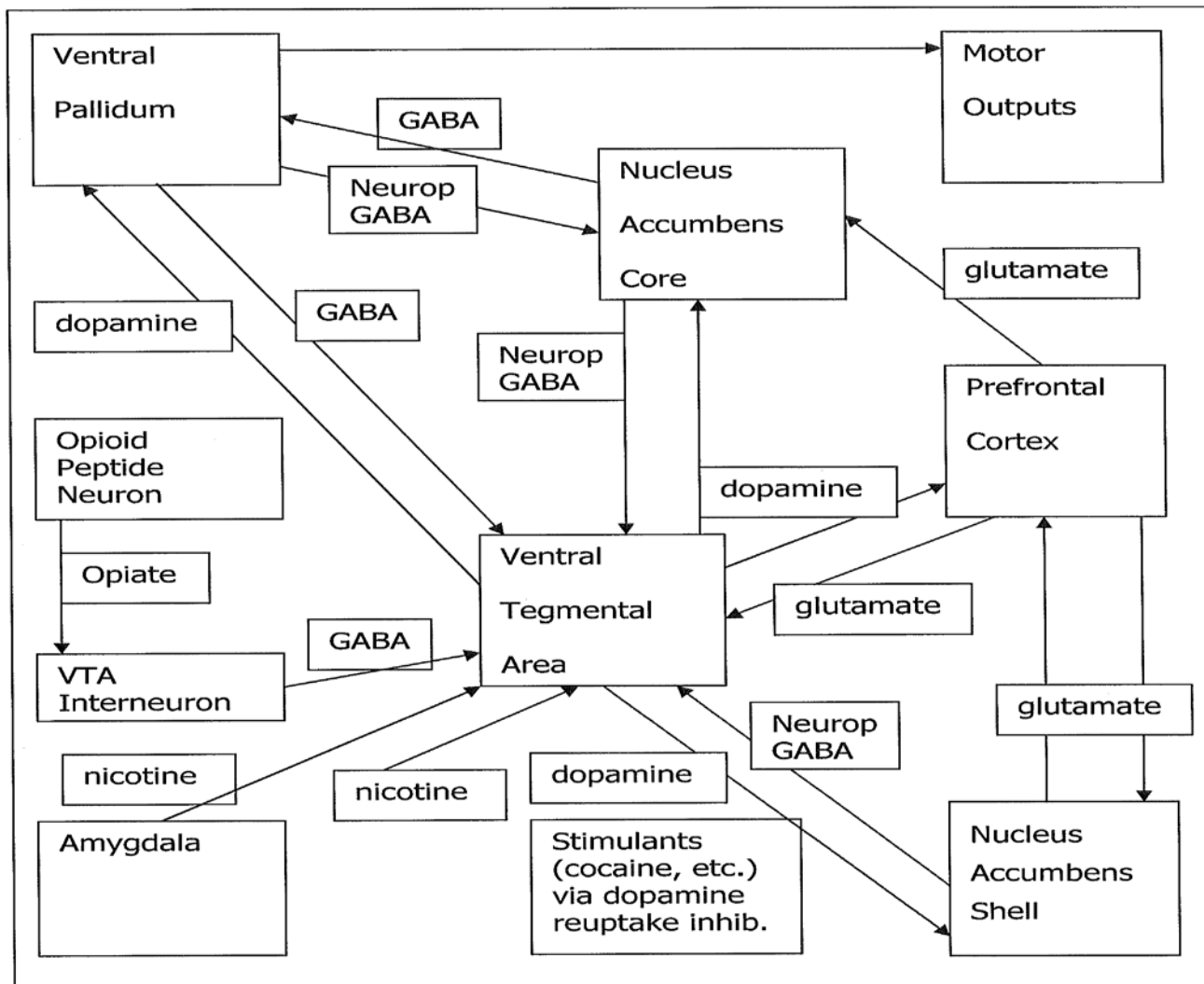
Toxoplasmosis Gondii

- ▶ http://www.youtube.com/watch?v=__K104jSGzs

Addiction and Will, Johnson, 2013

- ▶ Frontiers in Human Neuroscience

BRAIN ADDICTION PATHWAYS



Craving/Dreaming Pathways: Neurop=neuropeptides, GABA=gamma amino butyric acid

Jayawardene 2014 Gateway Theory, J Addict Med 8:102-10

- ▣ 20% of 48,000 Indiana 12th graders misused Rx
- ▣ 73% reported lifetime use of an addictive drug
- ▣ Four interacting drugs: alcohol, nicotine, cannabis, Rx
- ▣ 0.2% used Rx alone, 19% used simultaneously with another addictive drug
- ▣ 70% of crack users, 49% steroid users started heroin

483 College Students: 17 – 19

Garnier 2010

- ▣ Meds of any kind (ADHD, pain, asthma, etc)
- ▣ 36% diverted meds
- ▣ 34% sharing
- ▣ 9% selling
- ▣ ADHD stimulants – 62%
- ▣ Analgesics – 35%
- ▣ Drug sharing a risk factor for: heavy drinking, alcohol abuse, drug abuse

ADHD Meds Diverted

▣ Amphetamine/Dextroamphetamine	71%
▣ IR methylphenidate	37%
▣ XR methylphenidate	39%
▣ Opioids	35%
▣ Bupropion (450mg/day)	0
▣ Approached to divert	54%

Psychological Sequelae of Addiction

- ▶ Defenses of denial; use is “OK”
- ▶ Defenses make no sense because they are arrayed against internal stimuli
- ▶ “We all have to die sometime”
- ▶ “I can’t do two things at once”
- ▶ “It’s a reaction to stress”
- ▶ Idealization

Idealization is Catching

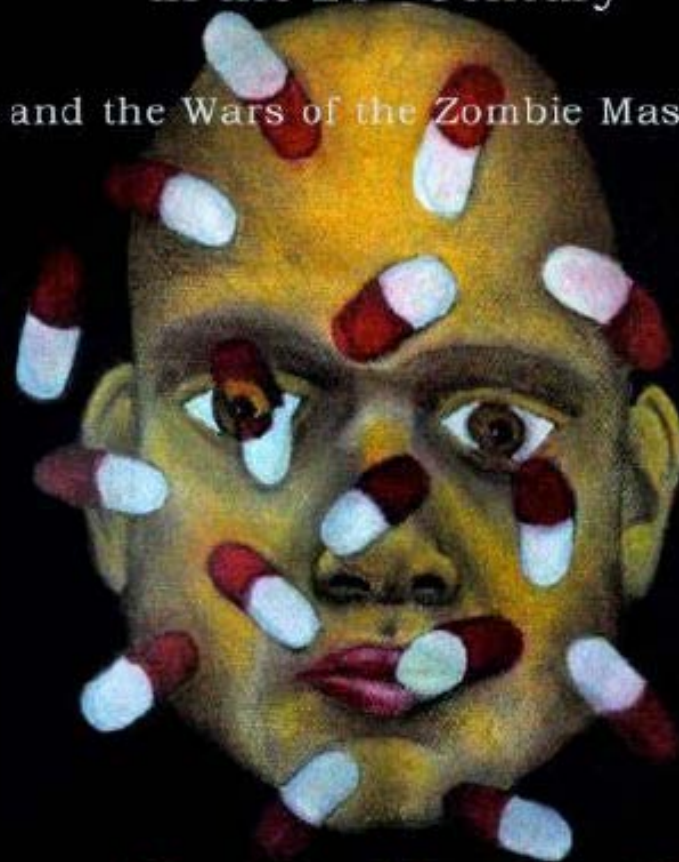
- ▶ Facilitates rlsp
- ▶ Creates pleasure
- ▶ Gives a sense of omnipotence
- ▶ Is a rebellion that creates a feeling of separateness
- ▶ Makes rlsp impossible
- ▶ Creates pain
- ▶ Makes one impaired
- ▶ Is a compliance with the attacking introject that undercuts aggress.

Gegensatzpress.com
/zombies OR Brian
Johnson M.D. AND
zombies

Brian Johnson, M.D.

Widespread Zombification
in the 21st Century

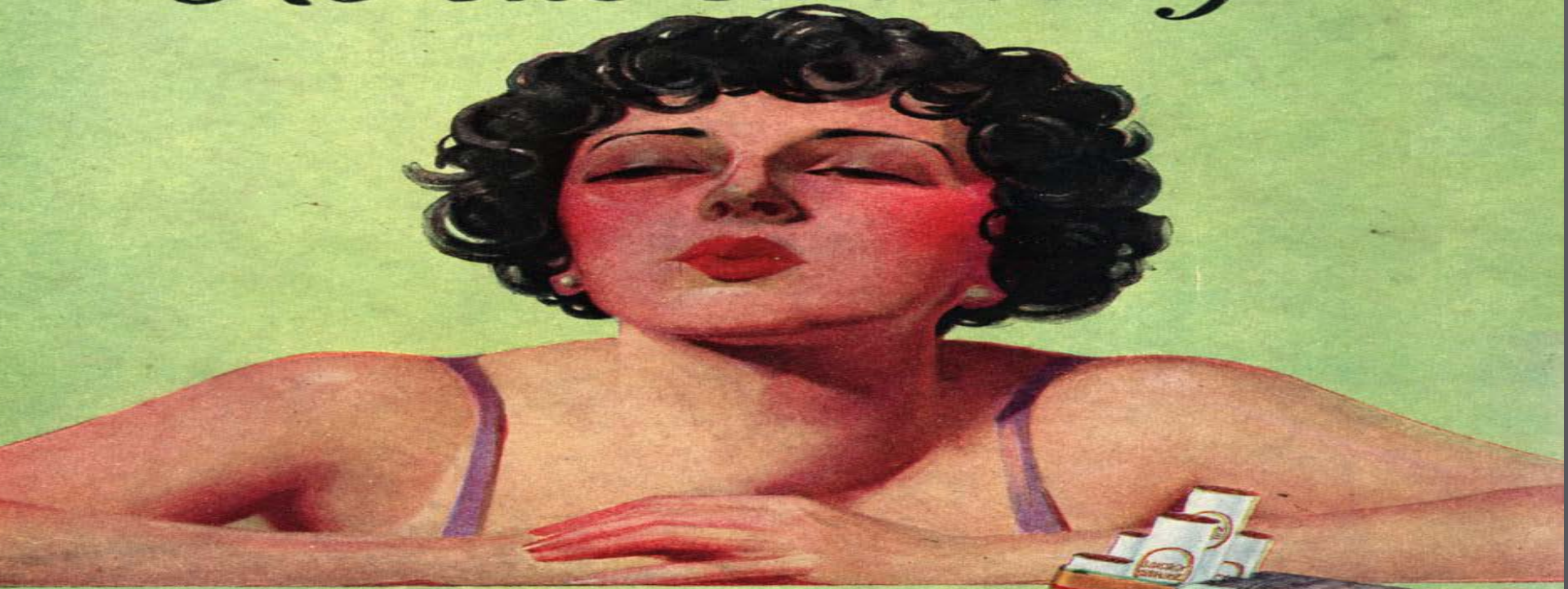
and the Wars of the Zombie Masters



D R U G S

For Kids — and the Occasional Interested Parent

To keep a slender figure
No one can deny...



"It's toasted"
No Throat Irritation - No Cough.

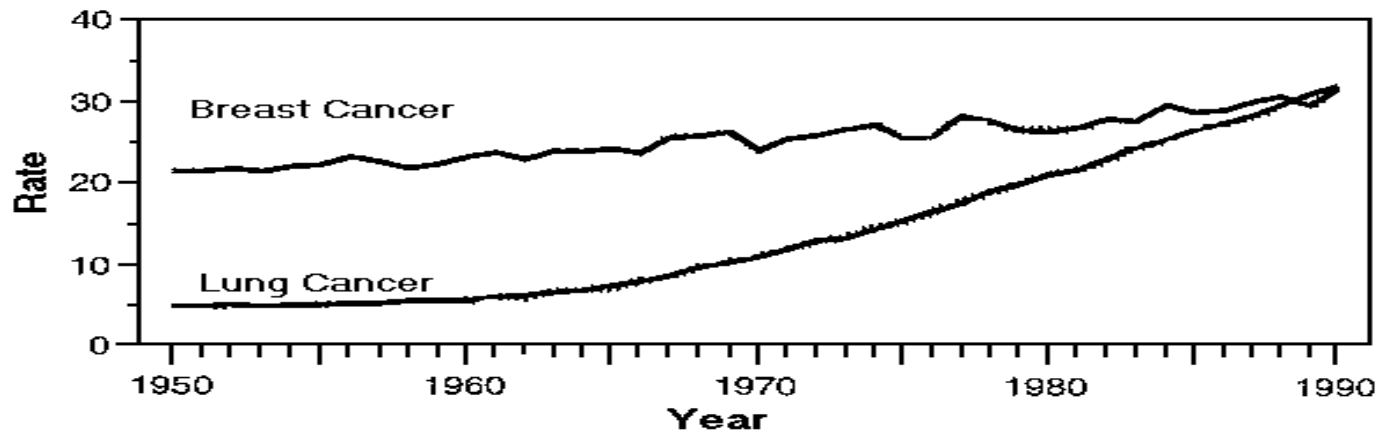
Women and Smoking

Rates men ~ women

Highest in those living below the poverty level

Lung cancer # 1 cancer death

Cancer Death Rates in Women after 1950



KELLY,
(C. Boston)



OLD JUDGE & GYPSY QUEEN CIGARETTES

Marketing Drugs

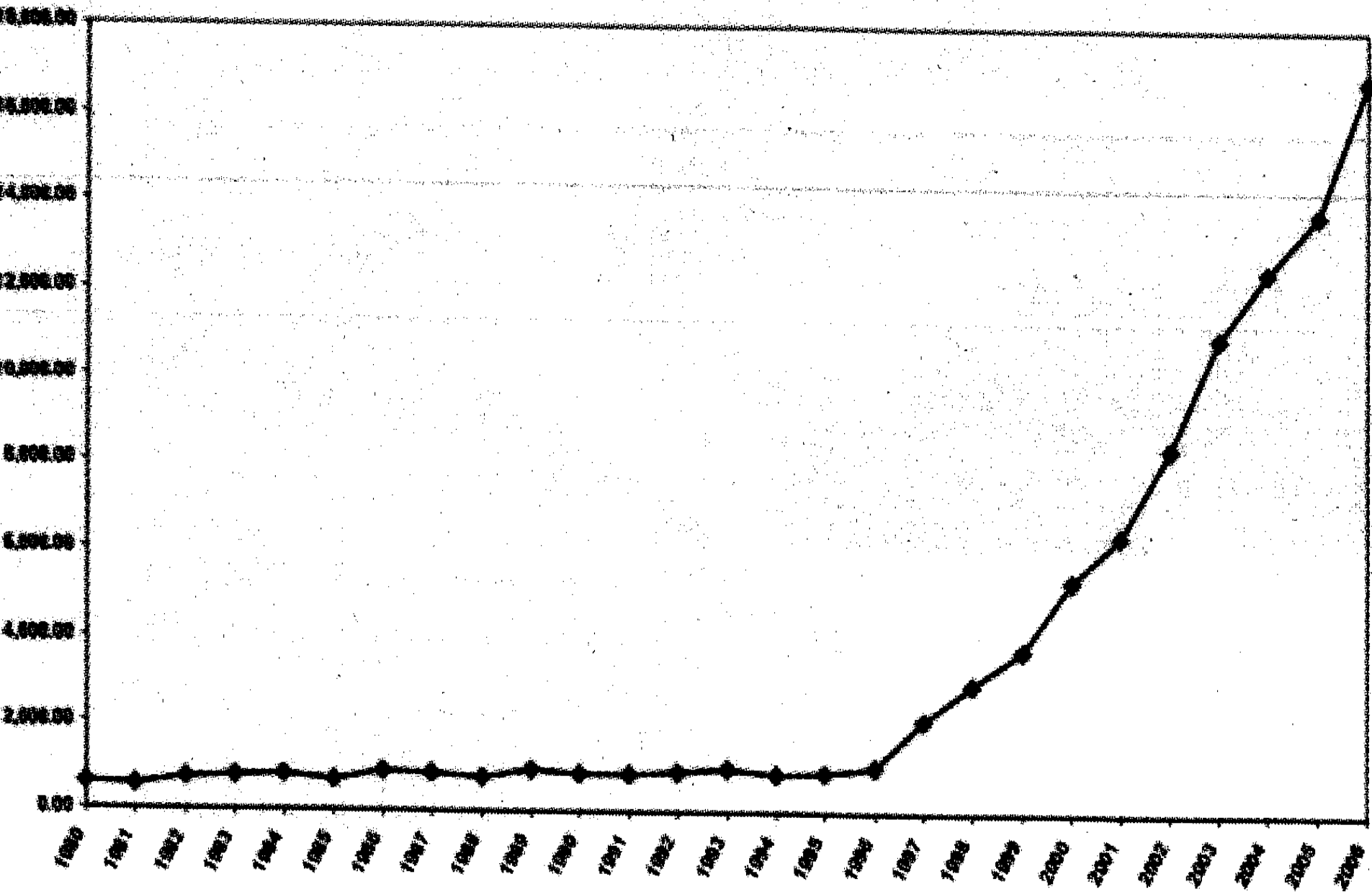
- ▶ 2/7 billion humans use nicotine
- ▶ 1 billion humans drink 3+ drinks/day
- ▶ Revenues=Oil and gas, worldwide tourism
- ▶ Tobacco – 9% of worldwide deaths
- ▶ Alcohol – 4% worldwide deaths
- ▶ Love is irrational, addictive drug industry captures the brains/will of its customers

Opioid Use Has Exploded!

- ▣ 2009 USA, 5% of world's population
- ▣ 56% of global morphine
- ▣ 81% of global oxycodone
- ▣ 99% of global hydrocodone

(Huxtable 2011)

New York Consumption of Oxycodone 1980 - 2006



Sources: U.S. Dept. of Justice, Drug Enforcement Administration, Office of Diversion Control

“PAIN MANAGEMENT: A FUNDAMENTAL HUMAN RIGHT”

- ▣ BRENNAN, CARR, COUSINS (2007)
- ▣ “REASONS FOR DEFICIENCIES IN PAIN MANAGEMENT INCLUDED CULTURAL, SOCIETAL, RELIGIOUS AND POLITICAL ATTITUDES, INCLUDING ACCEPTANCE OF TORTURE. STRATEGIES FOR IMPROVEMENT INCLUDE FRAMING PAIN MANAGEMENT AS AN ETHICAL ISSUE; PROMOTING PAIN

CONTINUED

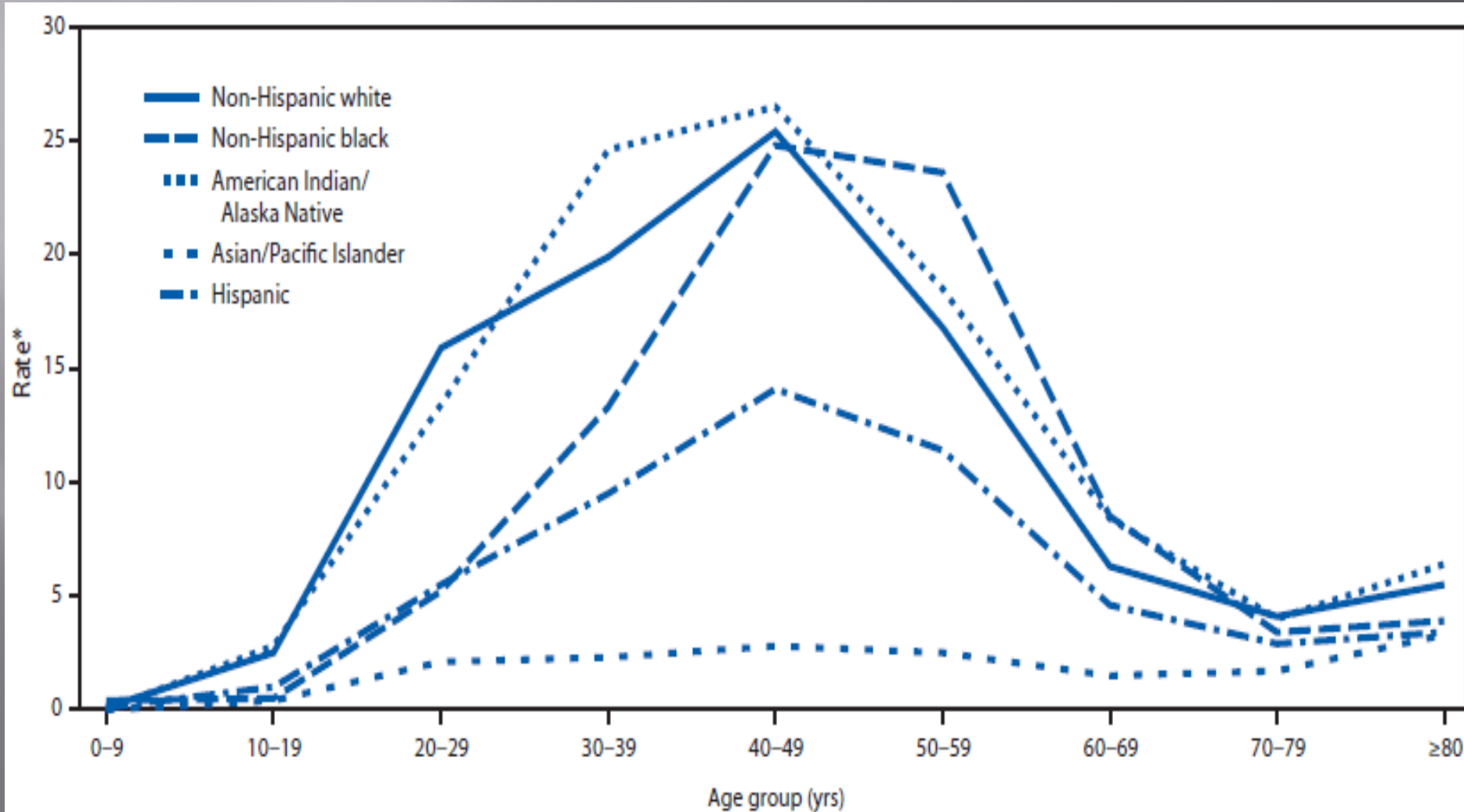
- ▣ MANAGEMENT AS A LEGAL RIGHT, PROVIDING CONSTITUTIONAL GUARANTEES AND STATUTORY REGULATIONS THAT SPAN NEGLIGENCE LAW, CRIMINAL LAW, AND ELDER ABUSE; DEFINING PAIN MANAGEMENT AS A FUNDAMENTAL HUMAN RIGHT, CATEGORIZING FAILURE TO PROVIDE PAIN MANAGEMENT AS PROFESSIONAL MISCONDUCT.

Opioid-Associated Deaths - USA

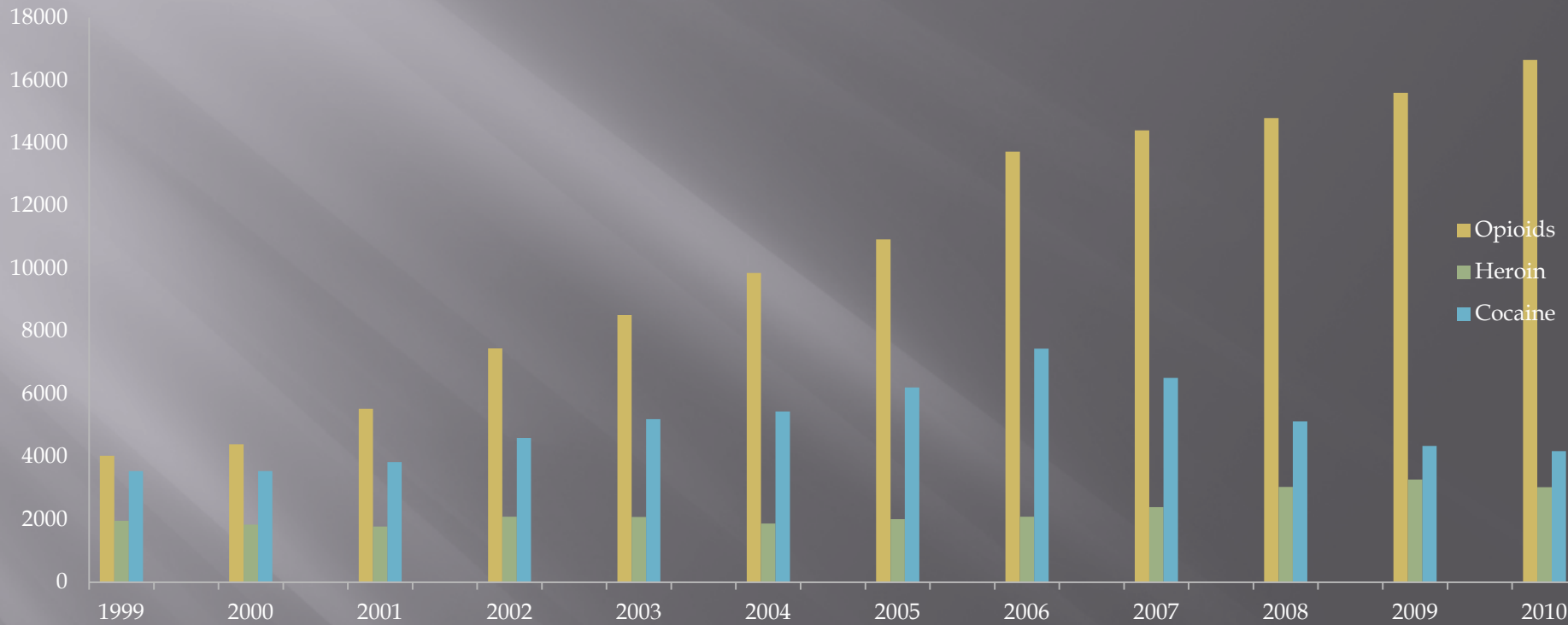
▣ Year	<u>1998</u>	<u>2005</u>
▣ Oxycodone	14	1007
▣ Morphine	82	329
▣ Fentanyl	92	1245
▣ Methadone	8	329

(Huxtable 2011)

Mack, KA. 2013 Drug-induced deaths - United States, 1999-2010. [MMWR](#) 22:Suppl 3:161-3.



Unintentional Overdose Deaths by Major Type of Drug Involved, United States 1999-2010 *



The impact of increased prescribing of opioids by physicians on overdose deaths. Note that heroin deaths are steady during this period. Data from Centers for Disease Control and Prevention WONDER.

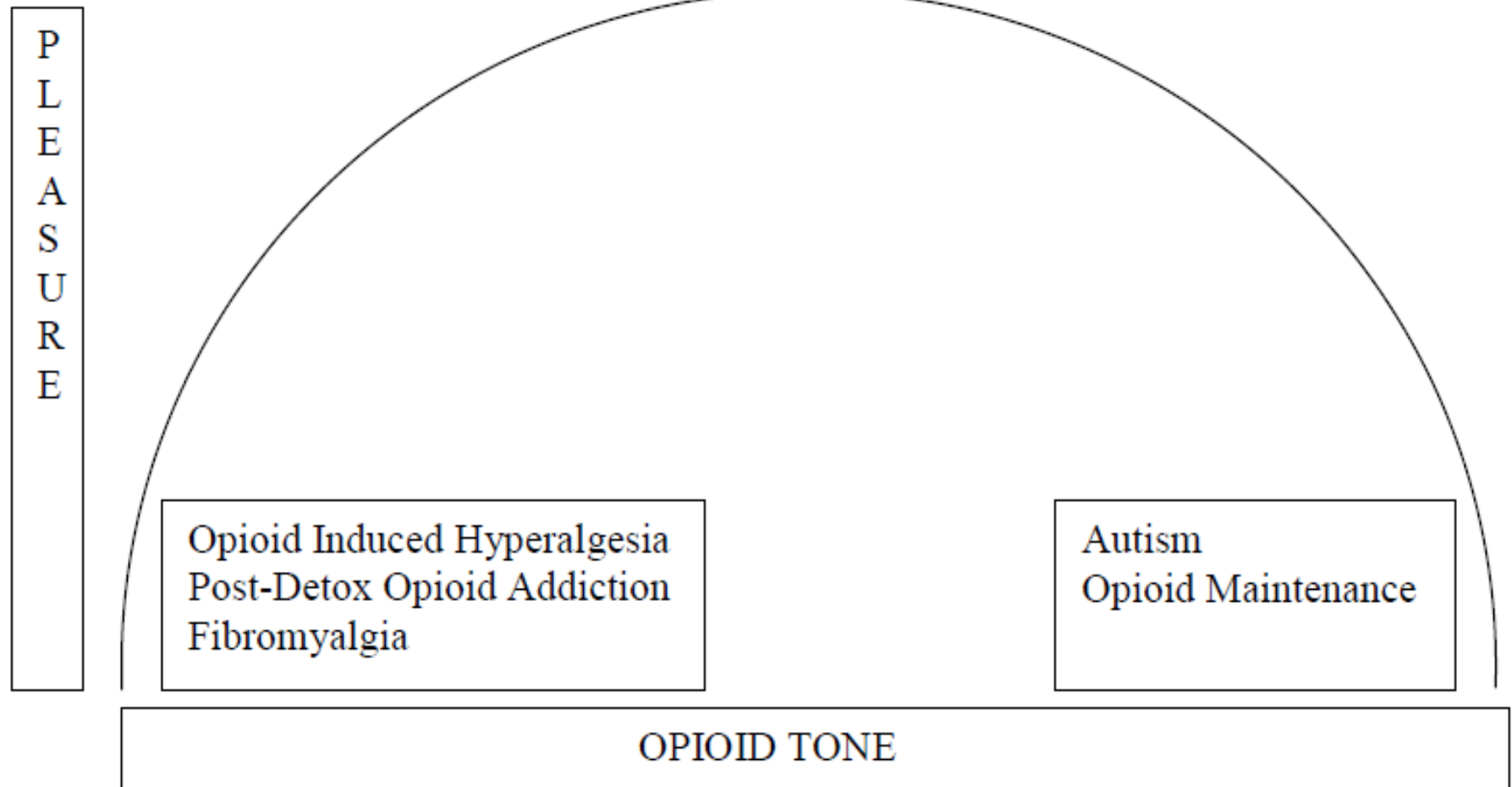
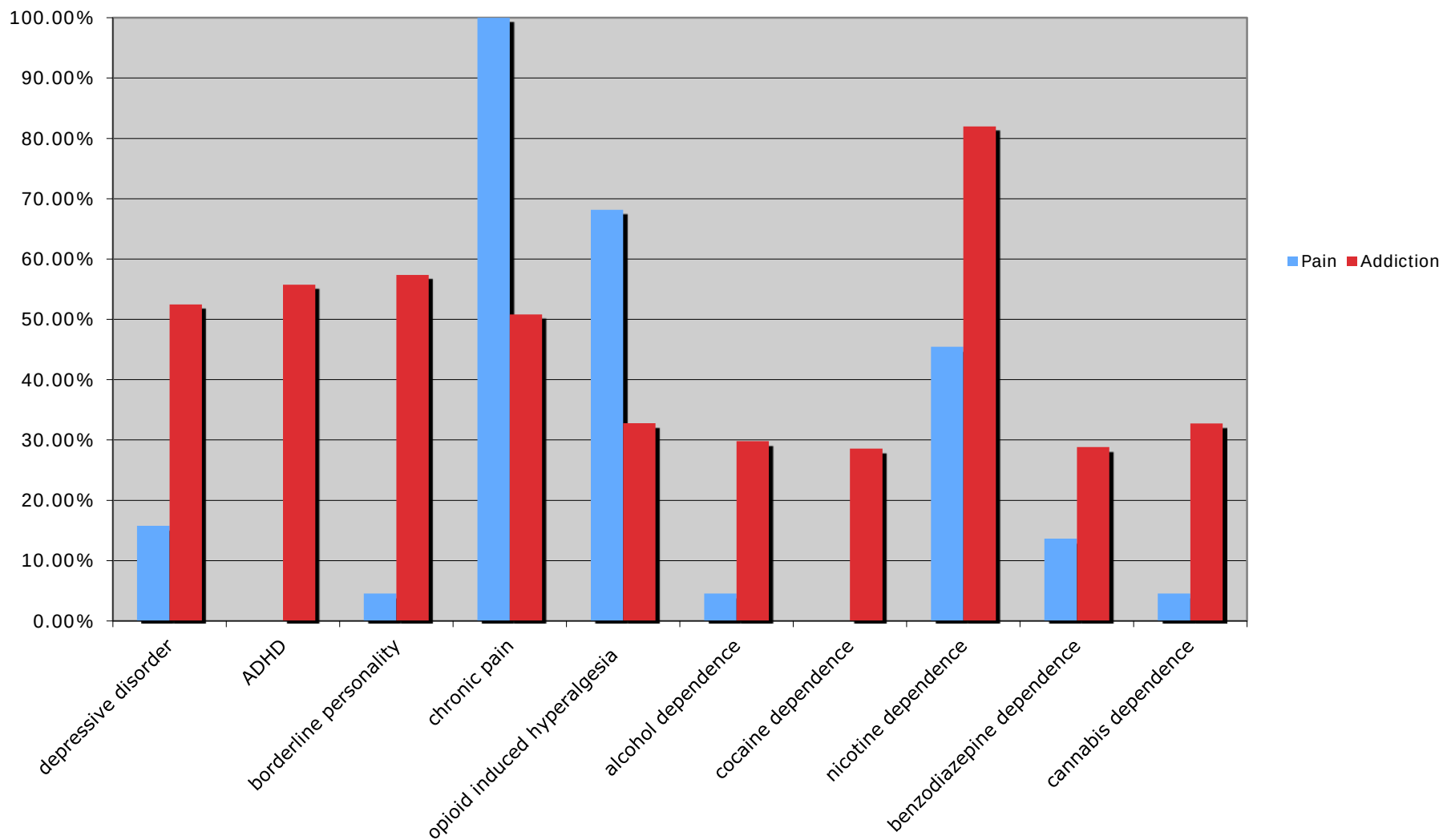
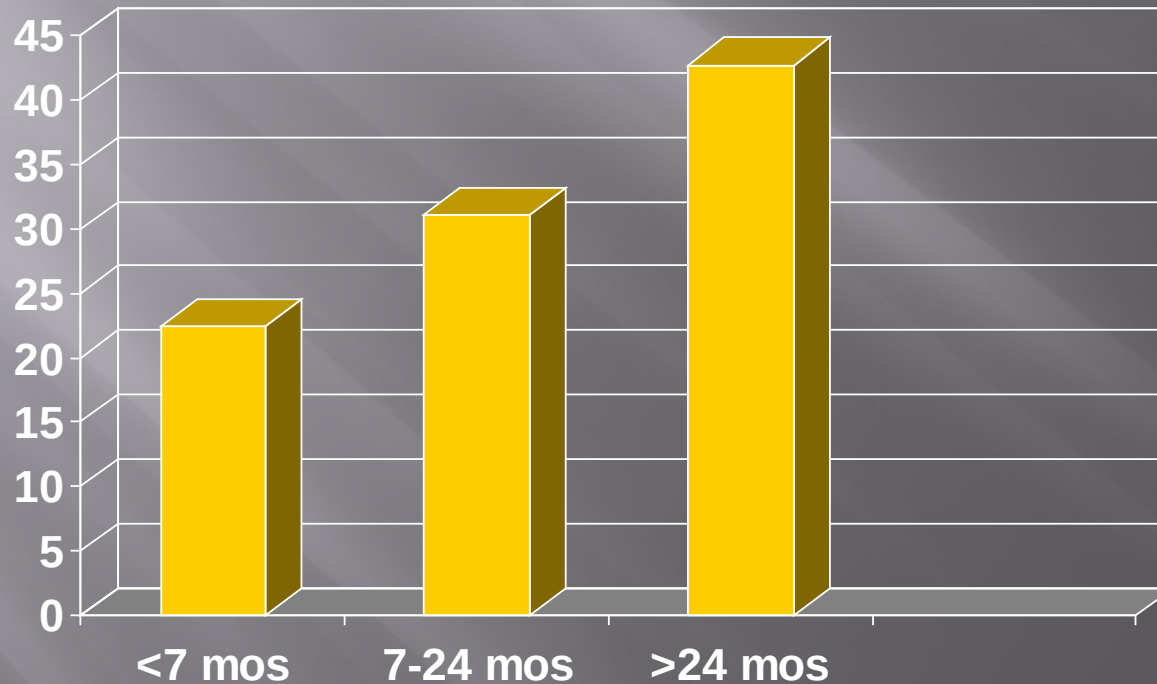


Figure 1 – Relationship of pleasure and opioid tone in the central nervous system subcortical pathways

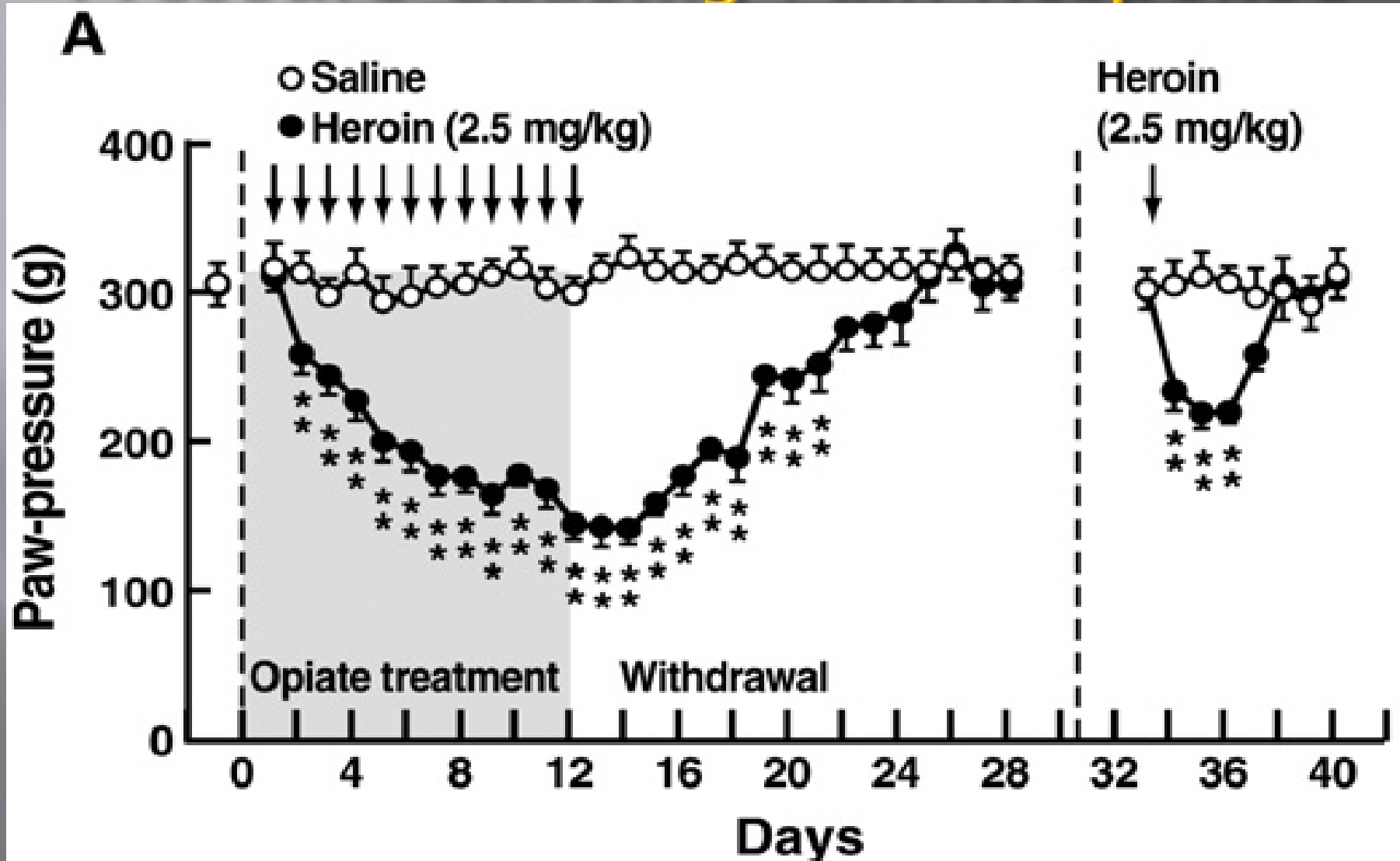


ROSENBLUM ET AL. JAMA 2003

Effect of Duration of Methadone Therapy on
Percent with Severe Chronic Pain

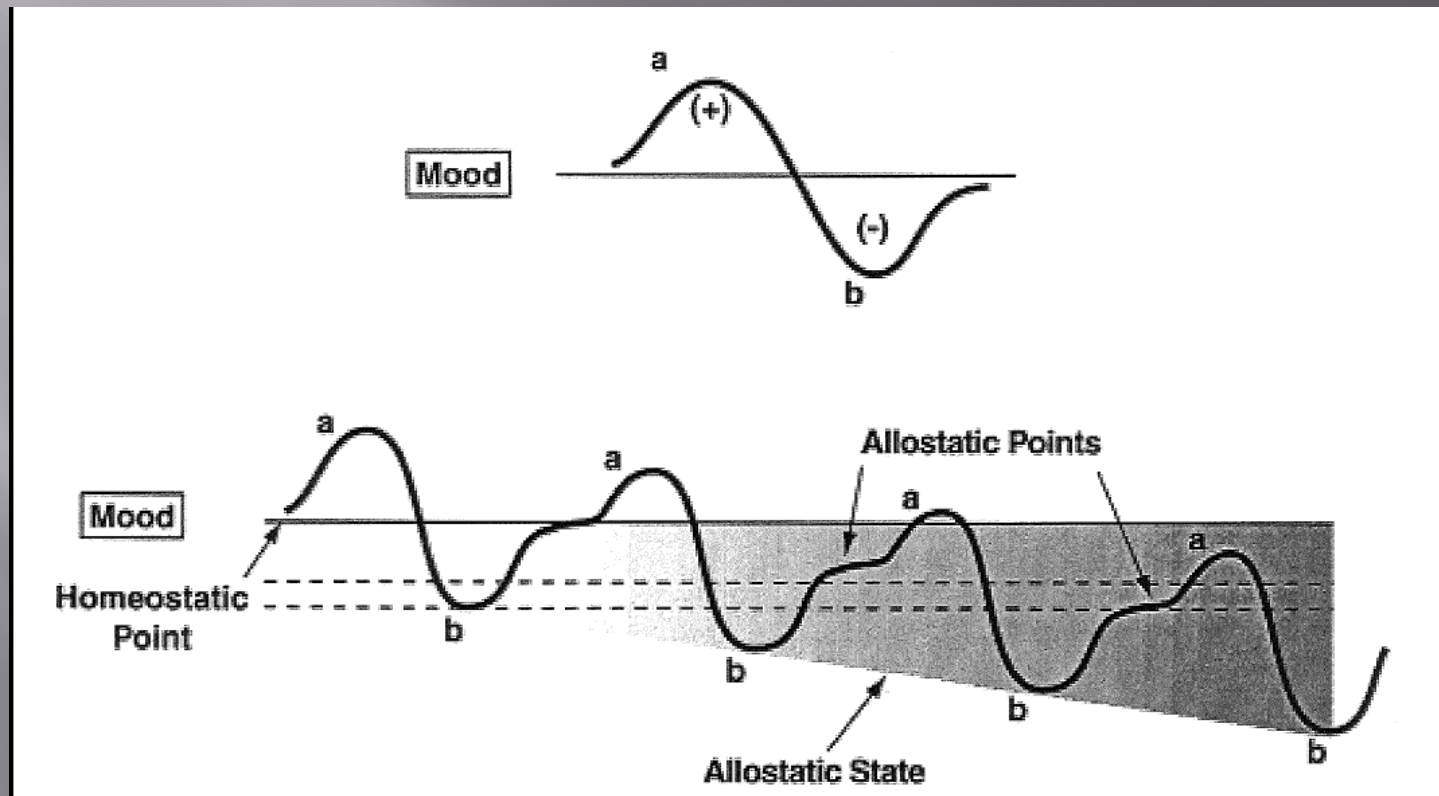


Celerier 2001, Amount of Pressure Causing Pain Response



Mood Deterioration

Koob and LeMoal '01



HUMAN HYPERALGESIA

- ▣ COLD PRESSOR TEST (CPT) TROUGH:
 - 56 SEC. CONTROLS
 - 15 SECONDS ON METHADONE (White 2004)
- ▣ HAY-WHITE 2009
 - CPT 31 CONTROL
 - 18-20 ON MORPHINE FOR PAIN, METHADONE FOR PAIN, METHADONE FOR ADDICTION
- ▣ 4 MG METHADONE=30 MG MORPHINE
- ▣ Patients maintained on methadone or morphine; whether for pain or addiction, are pain-sensitive (OIH)

UH Psychiatric Pain Consultation Cold Pressor Test (N>34 seconds)

<u>Age/Gender</u>	<u>CPT-Seconds</u>	<u>Pain</u>	<u>Medication</u>
▣ 30/female	3	8	hydrocodone
▣ 26/female	10	8	oxycodone 240/day
▣ 40/female	14	10	illicit painkiller
▣ 42/male	5	8	oxycodone 60/day
▣ 17/female	3 minutes	10	oxycodone
▣ 27/male	10	7	hydrocodone, then methadone
Repeated after detox-3 minutes		2	1 week later/none

(These are the first six CPTs done by the author at University Hospital, Syracuse, N.Y. 5/6 patients are showing OIH. The 27 year old man improved with detox; less pain.)

What is the Ideal Tx for Opioid Addiction?

- ▣ Opioid maintenance with buprenorphine
- ▣ Opioid maintenance with methadone
- ▣ Detox and drug-free treatment
- ▣ Unknown