

## Learning Objectives

1. Apply neurobiological concepts to treat patients who suffer from substance use disorders.
2. List three psychosocial and three pharmacological interventions in the treatment of addiction.

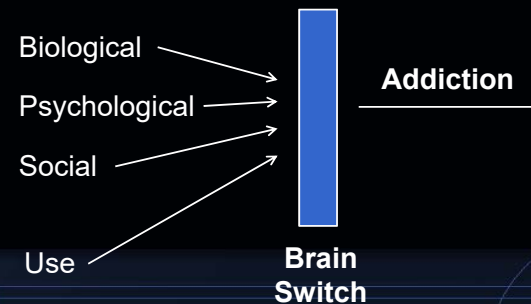
## Outline

1. Neurobiology of Addiction
2. Major Classes of Drugs
3. Diagnosis and Brief Intervention
4. Psychosocial Treatments
5. Summary

# 1

## Neurobiology of Addiction

## The Fundamental Model



## The Origins of the Opioid Epidemic

### ADDICTION RARE IN PATIENTS TREATED WITH NARCOTICS

*To the Editor:* Recently, we examined our current files to determine the incidence of narcotic addiction in 39,946 hospitalized medical patients<sup>1</sup> who were monitored consecutively. Although there were 11,882 patients who received at least one narcotic preparation, there were only four cases of reasonably well documented addiction in patients who had no history of addiction. The addiction was considered major in only one instance. The drugs implicated were meperidine in two patients,<sup>2</sup> Percodan in one, and hydromorphone in one. We conclude that despite widespread use of narcotic drugs in hospitals, the development of addiction is rare in medical patients with no history of addiction.

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HERSHEL JICK, M.D.  
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1. Jick H, Miettenen OS, Shapiro S, Lewis GP, Siskind Y, Slone D. Comprehensive drug surveillance. JAMA. 1970; 213:1455-60.
2. Miller RR, Jick H. Clinical effects of meperidine in hospitalized medical patients. J Clin Pharmacol. 1978; 18:180-8.

Porter and Jick, *New England Journal of Medicine*, January 10, 1980.

## ... and the Follow-Up

**FREEDOM FROM PAIN!**

Extra strength pain relief  
free of extra prescribing  
restrictions.

- Telephone prescribing in most states
- Up to five refills in 6 months
- No triplicate Rx required

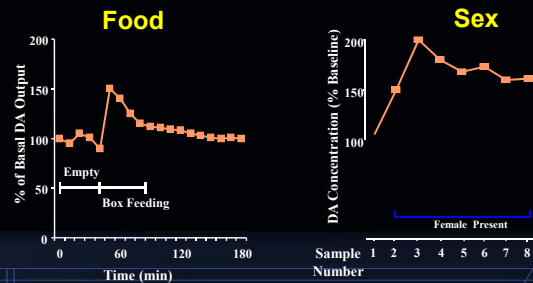
Excellent patient acceptance.  
In 12 years of clinical experience, nausea, sedation and constipation have rarely been reported.

	Hydrocodone	Vicodin	Hydrocodone	Vicodin
CONCENTRATION	55	55	55	55

The heritage of VICODIN<sup>®</sup> over a billion doses prescribed.

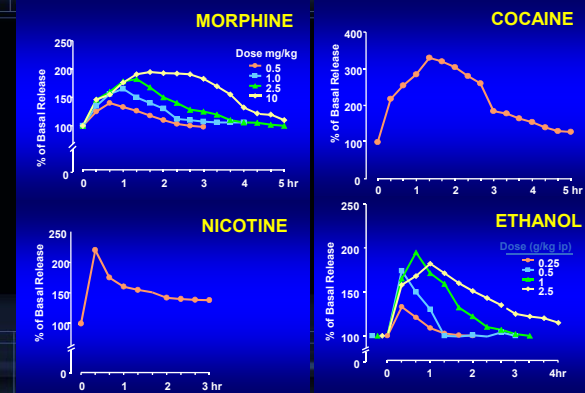
- VICODIN ES provides greater central and peripheral action than other hydrocodone and/or morphine combinations.
- Four to six hours of extra strength pain relief from a single dose.
- The 14th most frequently prescribed medication in America!

## Natural Rewards and Dopamine Levels



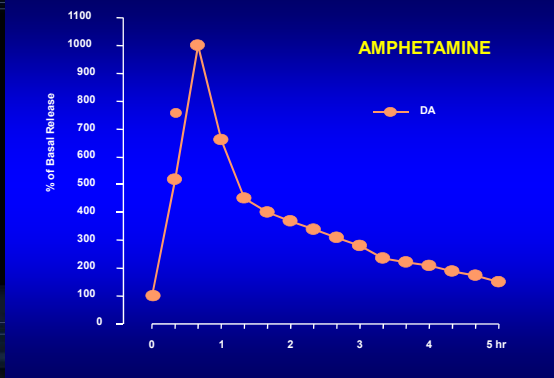
Adapted from: Di Chiara, *Neuroscience*, 1999; Fiorino and Phillips, *J Neuroscience*, 1997.

## Effects of Drugs on Dopamine Levels



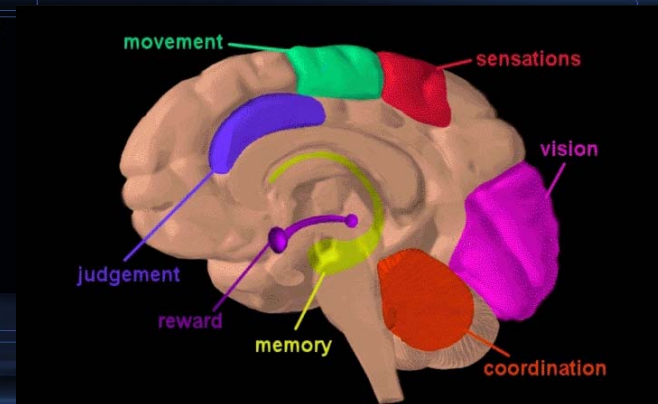
Adapted from: Di Chiara and Imperato, *Proceedings of the National Academy of Sciences USA*, 1988; courtesy of Nora D Volkow, MD.

### The Special Case of the Amphetamines



Adapted from: Di Chiara and Imperato, *Proceedings of the National Academy of Sciences USA*, 1988; courtesy of Nora D Volkow, MD.

### Pleasure-Reward Pathways



National Institute on Drug Abuse, DrugAbuse.gov.

## 2

### Major Classes of Drugs

### ALCOHOL



## Alcohol Addiction

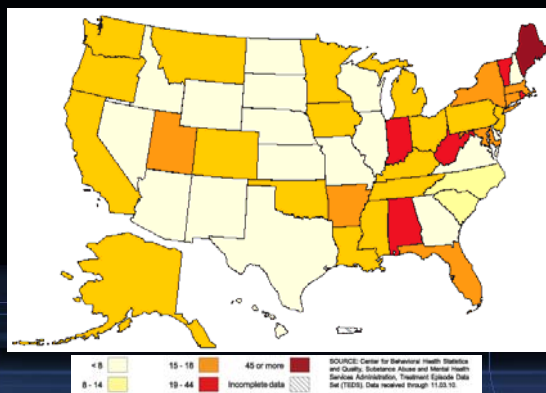
Disulfiram  
Naltrexone  
Acamprosate

## OPIOIDS



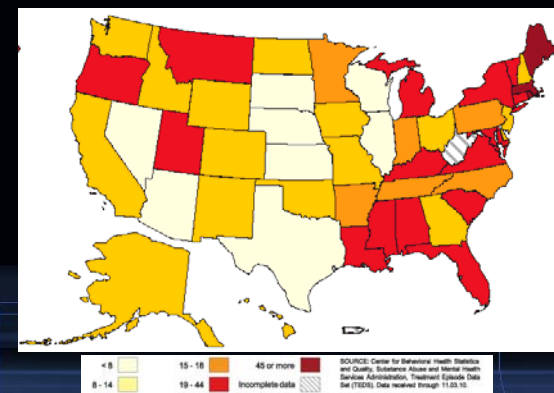
## Admissions: 1999

Primary non-heroin opioid admission rates (per 100,000)



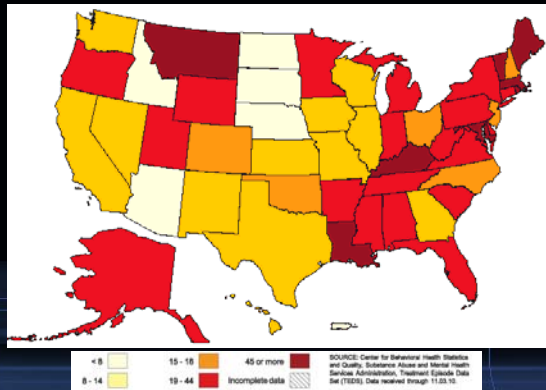
## Admissions: 2001

Primary non-heroin opioid admission rates (per 100,000)



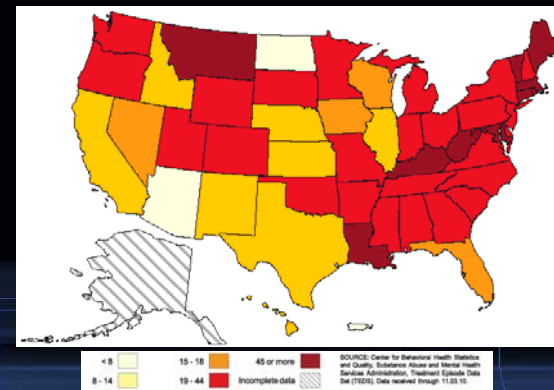
### Admissions: 2003

Primary non-heroin opioid admission rates (per 100,000)



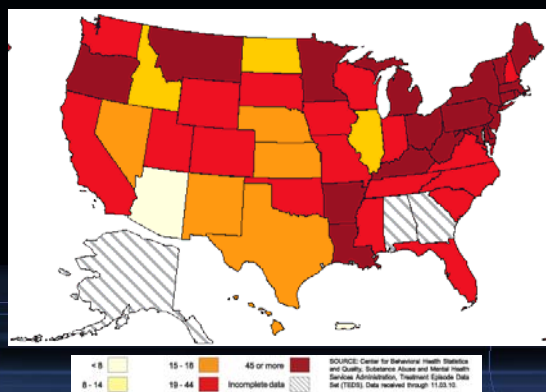
### Admissions: 2005

Primary non-heroin opioid admission rates (per 100,000)



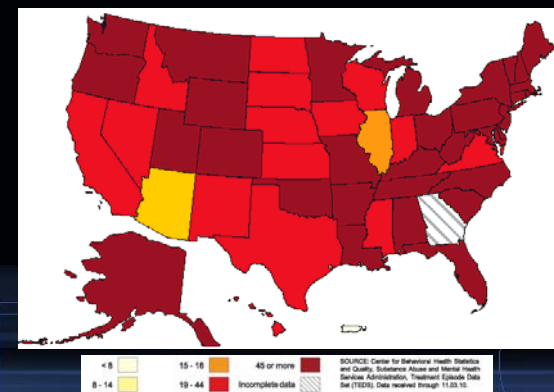
### Admissions: 2007

Primary non-heroin opioid admission rates (per 100,000)



### Admissions: 2009

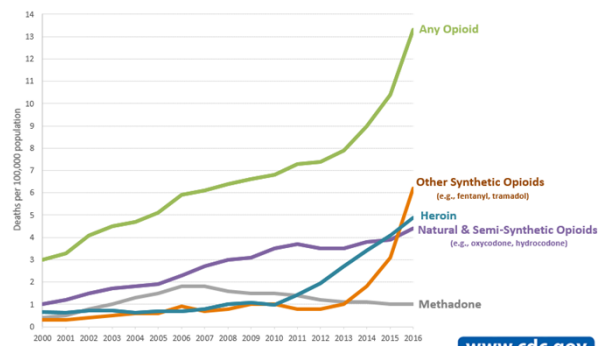
Primary non-heroin opioid admission rates (per 100,000)





## From Pills to Heroin to Fentanyl

Overdose Deaths Involving Opioids, by Type of Opioid, United States, 2000-2016



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality; CDC WONDER, Atlanta, GA; US Department of Health and Human Services, CDC, 2016.  
<https://wonder.cdc.gov/>

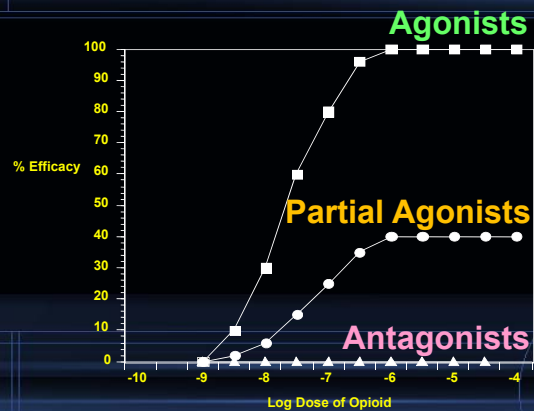
www.cdc.gov

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## Opioid Addiction

Methadone  
Naltrexone  
Buprenorphine

## Addiction Medications



Renner, Levounis, LaRose, Office-Based Buprenorphine Treatment of Opioid Use Disorder, APA Publishing, 2018.

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## STIMULANTS



## Stimulant Addiction

No Medications

## CANNABIS



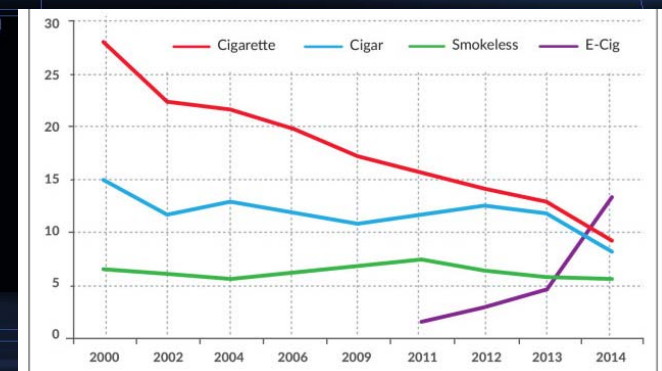
Synthetic Cannabinoids

Levounis and Herron, *The Addiction Casebook*, APA Publishing, 2014.

## Cannabis Addiction

No Medications

## TOBACCO



American Lung Association, *High School Tobacco Use (%) by Type*, based on CDC data, 2015.

## Tobacco Addiction

Replacement (NRT)  
Bupropion  
Varenicline

## BENZODIAZEPINES

- Antidepressants are the first-line treatments of anxiety disorders.
- Convert shorter-acting agents to clonazepam or chlordiazepoxide and taper.
- The longer the taper, the greater the chance of success (6-12 weeks minimum).

Ries et al, *Principles of Addiction Medicine*, 5<sup>th</sup> Edition, American Society of Addiction Medicine, 2014.

## THE BEHAVIORAL ADDICTIONS

- |                         |                |
|-------------------------|----------------|
| 1. Exercise             | 7. Kleptomania |
| 2. Food                 | 8. Love        |
| 3. Gambling             | 9. Sex         |
| 4. Internet Gaming      | 10. Shopping   |
| 5. Internet Surfing     | 11. Tanning    |
| 6. Texting and Emailing | 12. Work       |

Ascher and Levounis, *The Behavioral Addictions*, APA Publishing, 2015.

# 3

Diagnosis and  
Brief Intervention



## The DSM-5

### PHYSIOLOGY

**Tolerance**  
**Withdrawal**

### THE CORE PROBLEM OF SUBSTANCE USE

**Knowledge** of adverse consequences, yet continued use

### INTERNAL PREOCCUPATION

**Desire** to cut down

**Time**—a great deal of time—spent using

**Larger** amounts or longer periods of use than intended

**Craving**

### EXTERNAL CONSEQUENCES

**Activities** given up

**Role** obligations neglected

**Social** or interpersonal problems

**Hazardous** use

Levounis, *Academic Psychiatry*, 2015.

## The Briefest Intervention

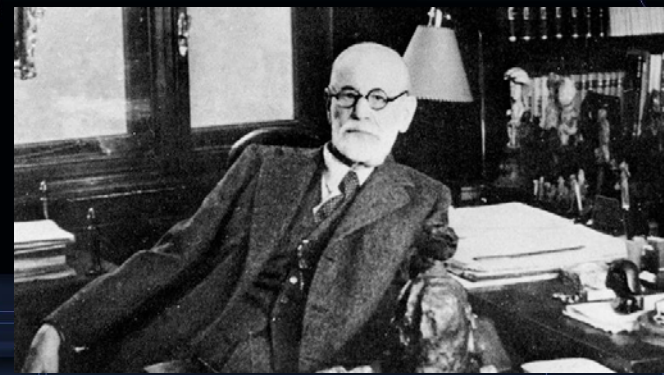
1. Be empathic and curious.
2. State your medical findings.
3. Educate about problematic use and addiction.
4. Advise.
5. Follow up.
6. Refer, if necessary.

National Institute on Alcohol Abuse and Alcoholism, NIAAA.NIH.gov.  
Levounis, *Academic Psychiatry*, 2018.

# 4

## Psychosocial Treatments

## 1<sup>st</sup> Wave: Psychoanalysis



Levounis, *Journal of Medical Toxicology*, 2016.

## 2<sup>nd</sup> Wave: Boot Camps



## 3<sup>rd</sup> Wave: The Current Approach

1. Mutual Help (12-step programs)
2. Counseling and Psychotherapy
3. Medications

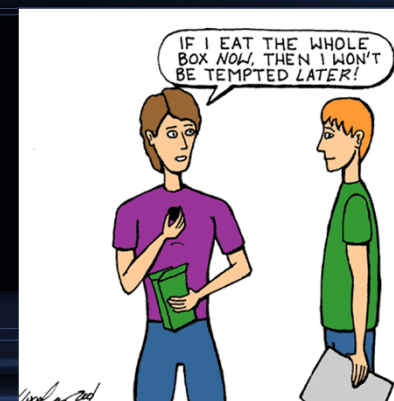
Nunes, Seizer, Levounis, Davies, *Substance Dependence and Co-Occurring Psychiatric Disorders*, 2010.  
 Levounis, Arnaout, and Marienfeld, *Motivational Interviewing for Clinical Practice*, 2017.  
 Renner, Levounis, and LaRose, *Office-Based Buprenorphine Treatment of Opioid Use Disorder*, 2<sup>nd</sup> Ed., 2018.

## Mutual Help

MEDICAL STAFF	PATIENTS	What Medical Staff Think Patients Think
1. Housing	1. Inner peace	1. Housing
2. Gov't Services	2. God	2. Outpatient Tx
3. Medical Services	3. Medical Services	3. Medical Services
4. Outpatient Tx	4. AA	4. Job
5. Job	5. Housing	5. Trusting People
6. Community	6. Spirituality	6. AA
7. Trusting People	7. Outpatient Tx	7. Inner Peace
8. Inner peace	8. Community	8. Community
9. God	9. Gov't Services	9. Gov't Services
10. Spirituality	10. Trusting People	10. Spirituality
11. AA	11. Job	11. God

Goldfarb, *American Journal of Drug and Alcohol Abuse*, 1996.

## Motivational Interviewing



Levounis, Arnaout, and Marienfeld, *Motivational Interviewing for Clinical Practice*, 2017.

## 4<sup>th</sup> Wave: Mindfulness



Zerbo, Schlechter, Desai, and Levounis, *Becoming Mindful*, 2017.

# 6

## Summary

### SIX TIPS FOR TREATING ADDICTION

1. Alcohol → AA
2. Opioids → Buprenorphine
3. Stimulants → CBT
4. Cannabis → MI
5. Tobacco → Varenicline
6. Benzos → Switch & Taper