7:45 – 9 am

Addiction Medicine Express

SPEAKER
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Presenter Disclosure Information

The following relationships exist related to this presentation:

- Petros Levounis, MD, MA: No financial relationships to disclose.

Off-Label/Investigational Discussion

- In accordance with pmiCME policy, faculty have been asked to disclose discussion of unlabeled or unapproved use(s) of drugs or devices during the course of their presentations.

Learning Objectives

1. Apply neurobiological concepts to treat patients who suffer from substance use disorders.
2. Identify intoxication and withdrawal syndromes of alcohol, opioids, and stimulants.
3. List three psychosocial and three pharmacological interventions in the treatment of addiction.

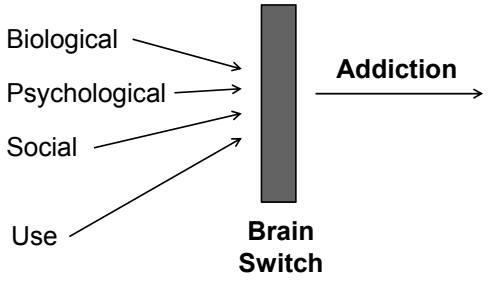
Outline

1. Neurobiology of Addiction
2. Major Classes of Drugs of Abuse
3. Behavioral Addictions
4. Assessments
5. Psychosocial Treatments
6. Public Health

1

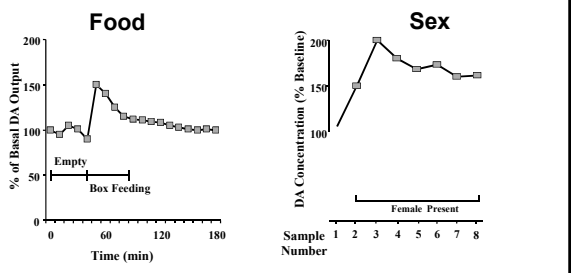
Neurobiology of Addiction

The Fundamental Model



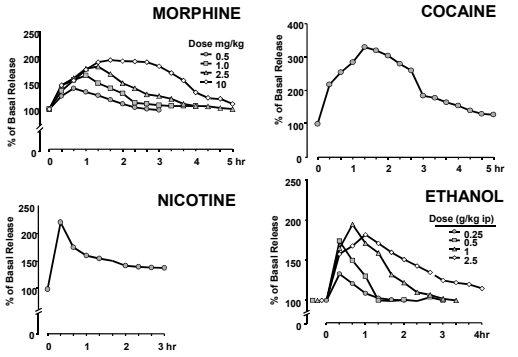
Levounis, *Journal of Medical Toxicology*, 2016.

Natural Rewards and Dopamine Levels



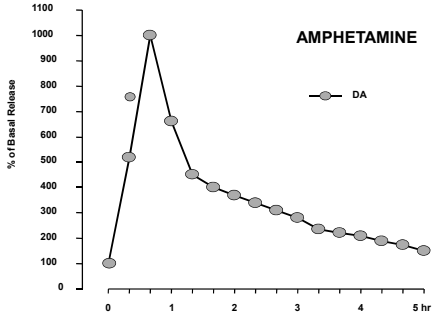
Adapted from: Di Chiara, *Neuroscience*, 1999; Fiorino and Phillips, *J Neuroscience*, 1997.

Effects of Drugs on Dopamine Levels



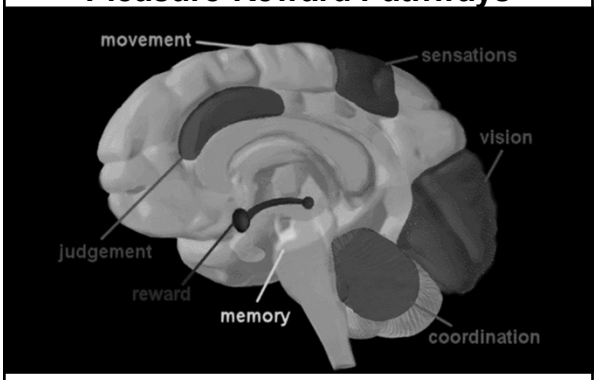
Adapted from: Di Chiara and Imperato, *Proceedings of the National Academy of Sciences USA*, 1988; courtesy of Nora D Volkow, MD.

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 of Abuse

ALCOHOL

• GABA	→	CNS Inhibition
• Glutamate	→	CNS Excitation
• Opioid	→	Euphoria
• Dopamine	→	Addiction
• Serotonin	→	Impulsivity
• Cannabinoid	→	Pleasant Feeling

Alcohol Intoxication

- ❖ 0-100 mg/dL — Well-being
- ❖ 100-200 mg/dL — Incoordination
- ❖ 200-300 mg/dL — Ataxia
- ❖ 300-400 mg/dL — Stage I Anesthesia
- ❖ 400-600 mg/dL — Coma
- ❖ 600-800 mg/dL — Death

➢ Treat supportively.

Alcohol Withdrawal

❖ Following the last drink:
- 6 to 24 hours: Autonomic Hyperactivity
- 24 to 48 hours: Seizures
- 48 to 96 hours: Delirium tremens

❖ Typically mild, occasionally severe, rarely fatal.

➢ Treat with:
- Mild: Hydration and Rest
- Moderate: Oral Chlordiazepoxide (CIWA Protocol)
- Severe: IV Chlordiazepoxide in ICU

Alcohol Addiction

Dislufiram

Naltrexone

Acamprosate

OPIOIDS

1. Naturally Occurring Opioids
   Morphine **Codeine**
2. Semi-Synthetic Opioids
   Oxymorphone **Oxycodone**
   Hydromorphone **Hydrocodone**
   Di-Acetyl-Morphine (Heroin)
3. Synthetic Opioids
   Fentanyl **(Tramadol)**
   Methadone **Buprenorphine**

Opioid Intoxication

1. Constricted pupils
2. Constipation
3. Nausea and vomiting (often projectile)
4. Respiratory depression
5. Coma and death

➢ Treat with naloxone.

Opioid Withdrawal

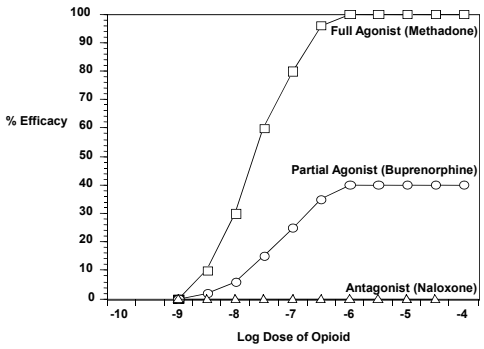
1. Dilated pupils
2. Diarrhea
3. Flu-like symptoms (rhinorrhea, lacrimation)
4. Yawning
5. Unbearable body aches
6. Sweats and piloerection (“cold turkey”)

➢ Treat with methadone or buprenorphine.

Opioid Addiction

Methadone
Naltrexone
Buprenorphine

Ceiling Effect of Buprenorphine



Renner and Levounis, *Office-Based Buprenorphine Treatment of Opioid Dependence*, APA Publishing, 2011.

STIMULANTS

- **Intoxication:**
  1. Euphoria
  2. Hypervigilance to frank paranoia
  3. Decreased appetite
  4. Seizures

- **Withdrawal:**
  1. Dysphoria
  2. Psychomotor retardation
  3. Increased appetite

Levounis, Zerbo, and Aggarwal, *Pocket Guide to Addiction Assessment and Treatment*, APA Publishing, 2016.

Stimulant Addiction

No Medications

CANNABIS

- **Intoxication:**

  If drunk – you run the RED lights
  If stoned – you stop at the GREEN lights

- **Withdrawal:**

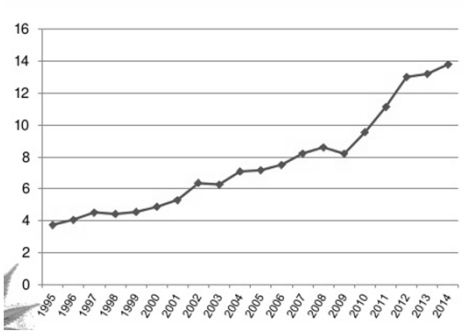
  Withdrawal syndrome is <u>not</u>:
  - As painful as heroin withdrawal,
  - As dangerous as alcohol withdrawal, or
  - As long-lasting as cocaine withdrawal

Levounis, Zerbo, and Aggarwal, *Pocket Guide to Addiction Assessment and Treatment*, APA Publishing, 2016.

Cannabis Addiction

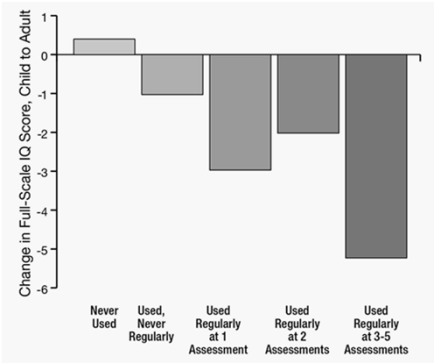
No Medications

% Delta-9 Tetra-Hydro-Cannabinol



University of Mississippi Marijuana Project; National Institute on Drug Abuse, DrugAbuse.gov.

Cannabis Addiction



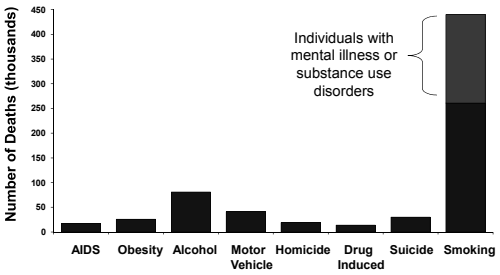
Meier, *Proceedings of the National Academy of Science*, 2012.

Therapeutic Potential

- Pain (cancer, multiple sclerosis)
- Nausea (cancer)
- Loss of appetite and wasting (HIV/AIDS)
- Increased ocular pressure (glaucoma)
- Inflammation (rheumatoid arthritis, Crohn's disease, ulcerative colitis)
- Epilepsy

Volkow, *New England Journal of Medicine*, 2014.

TOBACCO

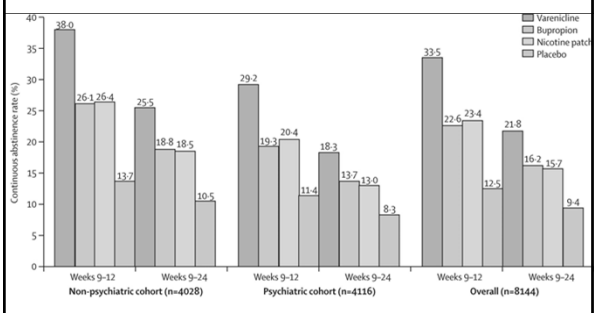


Centers for Disease Control and Prevention, *National Health Interview Survey*, 2007.

Tobacco Addiction

Replacement (NRT)
Bupropion
Varenicline

Varenicline Prevails



Anthenelli, *Lancet*, 2016.

BENZODIAZEPINES

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

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

SIX TIPS FOR TREATING ADDICTION

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

3

Behavioral Addictions

Impulsivity v. Compulsivity

- Both impulsivity and compulsivity show inability to refrain from dysfunctional repetitive behaviors.
- Impulsivity is driven by an effort to obtain arousal and gratification (norepinephrine and dopamine).
- Compulsivity is driven by an effort to reduce anxiety (serotonin).

Hollander and Stein, *Clinical Manual of Impulse-Control Disorders*, APA Publishing, 2006.

Dimensional Approach

COMPULSIVE END – OCD

Body Dysmorphic Disorder
Anorexia Nervosa
Hypochondriasis
Tourette's Syndrome
Trichotillomania
Autism
Binge Eating
Compulsive Buying
Kleptomania
Pathological Gambling
Self-Injurious Behaviors
Sexual Compulsions
Borderline Personality Disorder

IMPULSIVE END – Antisocial PD

Hollander and Stein, *Clinical Manual of Impulse-Control Disorders*, APA Publishing, 2006.

The Behavioral Addictions in 2016

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

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

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Assessments

SIX TIPS FOR RECOGNIZING ADDICTION

1. Moody
2. Changes in Sleep
3. Changes in Appearance
4. Work Performance
5. Financial Difficulties
6. Abusive Behavior

SCREENING

For Alcohol Use Disorders

- **MEN:**
  - **5 or more standard drinks in a sitting.**
  - **(15 or more per week.)**
- **WOMEN:**
  - **4 or more standard drinks in a sitting.**
  - **(8 or more per week.)**

National Institute on Alcohol Abuse and Alcoholism, NIAAA.NIH.gov.

BRIEF 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.

Urine Toxicology Detection Limits

❖ Alcohol	7-12 hours
❖ Alcohol (Ethyl glucuronide, EtG test)	4 days
❖ Amphetamines/Methamphetamines	2 days
❖ Benzodiazepines (Short-acting)	3 days
❖ Benzodiazepines (Long-acting)	30 days
❖ Cocaine	2-4 days
❖ Heroin (Morphine)	2 days
❖ Methadone	3 days
❖ Marijuana (Single use)	3 days
❖ Marijuana (Long-term heavy use)	>30 days

Moeller, *Mayo Clinic Proceedings*, 2008; Anders et al, *Alcohol and Alcoholism*, 2009.

The DSM-5

	PHYSIOLOGY
The	**Tolerance**
Wise	**Withdrawal**
	THE CORE PROBLEM OF SUBSTANCE USE
Know:	**Knowledge** of adverse consequences, yet continued use
	INTERNAL PREOCCUPATION
Decline	**Desire** to cut down
Tender	**Time**—a great deal of time—spent using
Loving	**Larger** amounts or longer periods of use than intended
Care,	**Craving**
	EXTERNAL CONSEQUENCES
And	**Activities** given up
Respect	**Role** obligations neglected
Silver	**Social** or interpersonal problems
Hair.	**Hazardous** use

Levounis, *Academic Psychiatry*, 2015.

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Psychosocial Treatments

3rd: The Current Approach

1. Mutual Help Groups (12-step)
2. Psychotherapy (CBT and MI)
3. Medications
4. Family Therapy
5. Primary Care Services
6. Mental Health Services
7. Aftercare

Nunes, Selzer, Levounis, Davies, *Substance Dependence and Co-Occurring Psychiatric Disorders*, 2010.

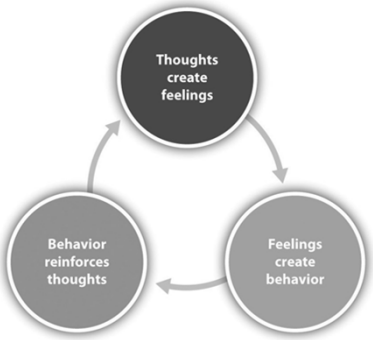
12-Step Facilitation

Attitudes and Perceptions

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.

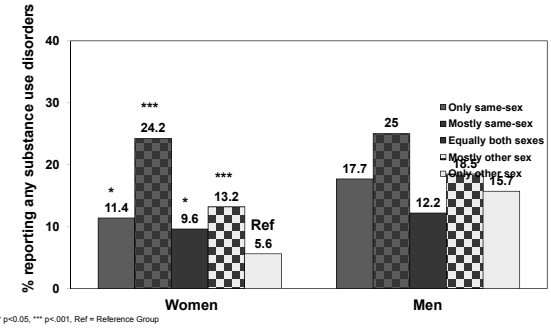
Cognitive Behavioral Therapy



Levounis and Arnaout, *Motivation and Change: A Practical Guide for Clinicians*, APA Publishing, 2010.

4th Wave: Mindfulness

And Back to Psychodynamics…



* p<0.05, *** p<.001, Ref = Reference Group

McCabe, *Addiction*, 2009, Courtesy of Sean E. McCabe, PhD; Levounis, Drescher, and Barber, *The LGBT Casebook*, APA Publishing, 2012.

6

Public Health

The Current Opioid Epidemic 1

ADDICTION RARE IN PATIENTS TREATED WITH NARCOTICS

To the Editor: ...y, we examined our c...ies to determine the incide... narcotic addiction ... hospitalized medical patients[1] ...re monitored ...tively. Although there were 11,882 pa... received ...one narcotic preparation, there were on... cases of ...ly well documented addiction in patients wi... addiction. The addiction was considered majo... stance. The drugs implicated were meperidine i...,[2] Percodan in one, and hydromorphone in one. We co... at despite widespread use of narcotic drugs in hospitals, t... ent of addiction is rare in medical patients with no ...tion.

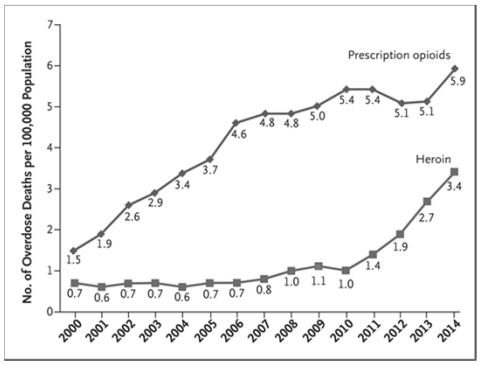
JANE PORTER
...ERSHEL JICK, M.D.
...llaborative Drug
Waltham, MA ...llance Program
Boston Uni... ...edical Center

1. Jick H, ... OS, Shapiro S, Lewis GP, ... Slone D. Compre... ug surveillance. JAMA. 1970; 2...
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.

The Current Opioid Epidemic 2

The Current Opioid Epidemic 3



Compton, *New England Journal of Medicine*, 2016.