

## The Current State of the Art: SUD, MH and Co-Existing Disorders

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Alltyr: Transforming Treatment for Addiction



## Overview

- The dismal state of current addiction treatment
- Recent research: A Plateau in Brain Science
- State of the art: Substance Use Disorders (SUD)
- State of the art: Mental Health Disorders (MH)
- State of the art: Co-existing Disorders (MHSUD)
- Practical application of existing knowledge
  - SUD
  - MH
  - MHSUD

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### Addiction

MONOGRAPH

SSA

doi:10.1111/ada.12093

#### The forest and the trees: relational and specific factors in addiction treatment

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Addiction, 110, 401–413 2014

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## INTRODUCTION

Imagine having a life-threatening illness and consulting a practitioner who told you: 'I don't pay much attention to research. I've been treating people for thirty years and I know what works. Participants in those clinical trials aren't like the patients I see. Besides, I don't have time to read scientific journals. They don't have anything to do with practice in the real world.'<sup>1</sup>

<sup>1</sup>This is a verbatim statement to the senior author from the prominent director of an addiction treatment service at a scientific conference in 1999.

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## A Man w/ His Head in the Sand



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## Imagine:

You develop breast cancer.  
You & your husband are  
both worried & try to  
figure out what to do.



You do some research online, talk to friends & family. There's this one famous treatment center, Very Shady Acres, that always seems to be in the news, advertises on TV, and celebrities often go there. You decide to look into that more.

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©Very Shady

It looks very nice, but it's expensive: \$50,000 for one month's treatment. They don't take insurance but you decide to take it out of retirement if it will give her the best chance. You're worried about that, but all of your family members are insisting that you go there, almost to the point of coercion.



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You meet with Dr. Slikengreedie, who seems very confident, & immediately wants you to stay for 30 days for his treatment. He promises you that "if you do what we tell you to I guarantee a full recovery."



You're puzzled that he didn't examine you, or discuss options, but you go along because of his reputation. He hands you off to other staff members. Again, you're puzzled because most of them are not medical professionals, all of them have had cancer themselves, & all of have been treated at Very Shady Acres.

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The staff initially seem nice, but if you question anything they do, they call you "resistant" & say you're "in denial." You notice that everyone there receives the same treatment, some for the 5<sup>th</sup> or even 10<sup>th</sup> time! But in spite of your misgivings, the culture of the place sweeps you along, & there is a lot of pressure to conform. You wonder why you never see the doctor again.

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You receive cancer treatment consisting of yoga, a macrobiotic diet, something called "group," which is more like a class, life coaching, DBT, mindfulness training & something called "trauma-informed therapy," even though you don't remember any trauma. You are told that you suffer from a disease that stems from character defects & spiritual deficiencies. You are asked to identify them.



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When you ask about surgery, radiation or chemotherapy, you are told that "we don't do that here," & "we don't believe in them." You are told that something called "The Program" should be enough; those other treatments are "crutches," & you are discouraged from considering them. You are forbidden from talking about any other method of treatment.

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But again you go along because everyone seems so sure about this, & The Program seems to have worked for the staff members. After a month, you are discharged & told to stick to the diet & yoga & spiritual practice and to go to 90 support group meetings in 90 days.

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You do the best you can to follow the recommended regime, although you aren't always 100% successful. Therefore you are shocked to discover the cancer has progressed. Your husband is angry & blames you for the recurrence. He had been taught at Very Shady Acres to use "tough love," so he kicks you out of the house, telling you not to come back until you're cured.



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You don't know what to do, so you go back to Very Shady Acres for another 30 days of the *exact* same treatment, for another \$50,000. You are told the progression is because you weren't "working The Program," & that you're selfish & willful, & deserved what you got.



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This time, you aren't willing to go along. You know there are other treatments that are based on scientific research, not on some belief in The Program. When you attempt to talk about this, you are warned that you are likely to be discharged "without staff approval" if you don't stop. After about a week of this, you leave. All of your family & friends reject & shun you, blaming you for not responding to the treatment.



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There are two endings to this story...

1. The sad one that is all too common
2. The happy one that is all too rare

Which one do you want to hear first?

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**THE SAD ENDING**

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By this time, your cancer has progressed & spread. It is no longer curable, and you die about a year later. Your family still blames you for not responding to The Program & you die alone & despondent.



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### What would you call the treatment provided?

- Excellent treatment you refused to follow?
- Malpractice?
- Negligence?
- Was informed consent provided?
- Why do we allow this to occur in this area of health care, but not in others?
- Are state agencies providing adequate oversight?

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### What Would You Do?

- Conclude that your wife was always willful & full of herself & deserved what she got?
- Give another \$50,000 to the Very Shady Acres Foundation to help others with the problem?
- Sue for malpractice?
- File a complaint with the state Board of Medical Practice?

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### THE HAPPY ENDING

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In spite of your family & all the others who believe in The Program for cancer, you persist. Almost all the treatment programs use the same approach, but after a lot of research, you find one that bases its treatment on scientific research. You are given a range of options, & told what the likelihood of recovery would be with each one.



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Your tumor is removed surgically, & you are given radiation & chemotherapy. The total cost is \$26,000, most of which is covered by insurance. After 5 years, you are still cancer free. Your family has finally come to realize that medical treatment is necessary. You unfortunately used up \$100,000 of your retirement funds to pay for the two stays at Very Shady Acres. But at least you're alive.



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### A CJS Version (Just for You!)

You are just a kid. You thought taking a few Vicodin at a party was just a fun thing to do. They're safe, right? Because they're prescription meds you got from your mom's bottle.



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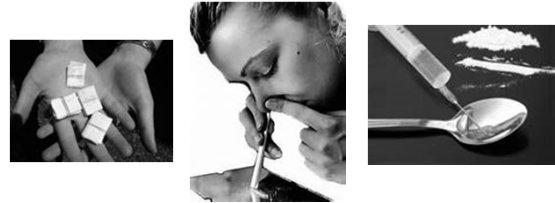
But you liked how they made you feel. A LOT! So you started taking them more often. Then you took more of them to get the same effect. Pretty soon, it was all you could think about & it started to take over your life. When you tried to stop, you couldn't.



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A friend introduced you to heroin, & you quickly got addicted. First you were snorting, but eventually you started injecting. Then you were totally hooked.



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You didn't want to tell your parents, or anyone else. So you lied, stole, skipped school, burglarized homes, all stuff you knew was wrong but you did it anyway, somehow thinking it was ok. You hated yourself for doing it, but you couldn't stop.



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Then, your worst nightmare happened. You bought dope from an undercover cop and were arrested. You were scared out of your mind.



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After you were processed, you were put in a cell & given nothing for withdrawal. You couldn't believe how bad it felt, how alone you were. You thought about killing yourself, even trying to tie a knot in the sheets, but it didn't work.



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You were charged with felony possession & assigned to drug court. The drug court judge, known as a hard-liner, was a firm believer in the 12-step program. He thought methadone & buprenorphine were just substituting one drug for another. So he sent you to a rehab center. But you felt so terrible, & it never got better, so you used again. You were sentenced to 6 months in prison.



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Prison policy prohibited methadone or buprenorphine maintenance, but there were more drugs in prison than on the street, so you kept using, sometimes taking methadone to get by. You were given some rehab in prison, and then released after serving your sentence.



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You quickly found out that you couldn't get a job, a student loan, or rent an apartment because of your drug felony. Your parents wouldn't take you back either. You were homeless, penniless on the street. You felt lousy all the time, like having a low-grade flu, & all you could think about was opiates.



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You started using again, were violated b/o a dirty UA, & sent back to prison for another 6 months. In prison, you were beaten by guards, raped by another inmate, & continued to use opioids. You were left naked in a cell for 36 hours, periodically hosed down with cold water.



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You were released again after serving your sentence. You now had PTSD w/ nightmares about prison, so you tried not to sleep, you avoided other people, you felt depressed & suicidal. You still felt awful all the time, & craved opioids. It didn't matter how many meetings you went to. You sought help at a mental health center, but they diagnosed you with drug-induced depression & recommended rehab.



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## Guess What? Two Endings!

1. The sad one
2. The happy one

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## THE SAD ENDING

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You kept using opioids, now dealing as well to support yourself. You were violated again for dirty UA's & sent back to prison, this time for two years.

You killed yourself by hanging 2 weeks after incarceration.



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## Questions

- Who is responsible for this young man's death?
- Why do we allow "personal beliefs" to override scientific evidence?
- The UN has declared that depriving opioid addicts of opioid medication maintenance while incarcerated is "cruel & unusual punishment," tantamount to torture. Why do we tolerate this?

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## THE HAPPY ENDING

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Your case was transferred to another judge who had recently joined the drug court. She had studied addiction treatment & knew that only methadone or buprenorphine maintenance was effective for opioid addiction. She referred you to a methadone maintenance program. For the first time you could remember, you felt well again, whole. With the help of a social worker on the drug court staff, you started to rebuild your life.



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You had a couple slips early on, but then never used heroin again. Eventually, you transitioned to buprenorphine. Your parents accepted you back. You enrolled in a community college with their help, completing a degree in computer science, & you were hired by a local company owned by a friend of the family. You did well there, advancing to a management position, & developed a relationship with a woman who neither drank nor used drugs. You are still taking buprenorphine every day. Just like a diabetic takes insulin.



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## What Is Addiction?

- Impaired control over use once it starts
- Preoccupation and craving (desire, wanting)
- Delay-discounting: discounting the longer term, larger reward in favor of a short-term but smaller reward
- Persistent desire to quit/cut down but being unable to do so

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## How Does Addiction Develop?

- A genetic diathesis or vulnerability (50-60%)
- Environmental factors
  - Early childhood neglect and/or abuse
  - Poor parenting
  - Social/peer support for use
  - Availability (including price)
  - Other mental or physical chronic disorders

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## Genetics determine:

- Whether & how much you like a drug
- Your tolerance of a drug w/o adverse effects
- Whether you are prone to anxiety or depression
- How strong your behavioral inhibition is
- Your temperament or personality (e.g., extraversion, agreeableness, curiosity, openness, conscientiousness, neuroticism (negative affect))



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## You are more likely to use larger amounts of a drug:

- If you like it (a lot)
- If you can tolerate it (a lot)
- If it's available easily
- If it's socially acceptable
- If it relieves negative affect
- If you feel stimulated by it (opiates/alcohol)



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## How Addiction Develops



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## What Controls Intake of Intoxicants?

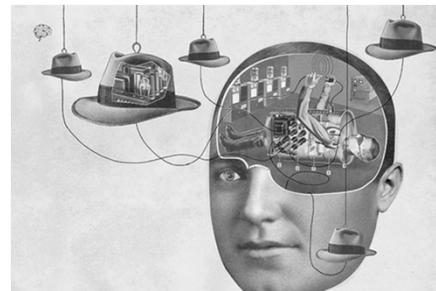
- The spirit? (or spirits?)
- The mind (where is that?)
- The gut?
- The Superego? (show it to me)
- Your mom?
- Your spouse?
- The bartender?
- How much money you have on you?



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## Brain Mechanisms Control Intake



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## The Brain is a Flesh & Blood Organ

- Think of what it's functions are
- What does it do, what does it regulate?
- Specific functions can get dysregulated just like any other organ



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## What Happens When These Organ Systems Get Dysregulated?

- Pancreas - diabetes
- Thyroid gland – hypo- or hyper-thyroidism
- Cardiovascular system- hypo- or hypertension, irregular heart rate, tachycardia, bradycardia
- Immune system – AIDS, cancer, psoriasis, asthma
- Intestines – IBS, constipation, diarrhea

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## What Higher-Order Functions Does the Brain Regulate?

- Mood
- Perception
- Cognition
- Memory
- Emotion
- Behavior

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## What Happens When These Functions Get Dysregulated?

- Mood – depression, mania
- Perception – hallucinations,
- Cognition – delusions, ADD, obsessions
- Memory – dementia, PTSD
- Emotion – anhedonia, emotional dysregulation, anxiety (fear)
- Behavior - ??

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## Addiction is a Result of Exposure to a Drug. It Does Not Precede It.

- Heavy drinking is like smoking, hypertension or high blood lipids
- These are asymptomatic risk factors that increase the risk of end-organ damage
- But not everyone exposed gets damage:
  - Not all smokers get lung cancer or COPD
  - Not all people with HTN have strokes
  - Not all people with high cholesterol have heart attacks
- They are simply at greater than average risk

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## What Is the End-Organ Damage That May Result from Heavy Substance Use?

- Alcohol: liver disease, cancer, heart failure
- Opioids: reduced testosterone, constipation
- Stimulants: stroke, heart attack
- Smoking: cancer, COPD, heart attacks, strokes
- Cannabis: psychosis
- But the Number 1 End-Organ Damage is to the Brain: Addiction

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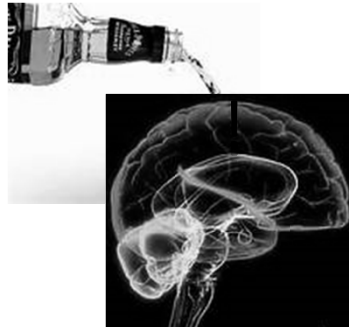
Expose the brain to high concentrations of a specific drug



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The Brain Changes in Response



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The Symptoms of Addiction Are the Result

- Impaired control once you start
- Preoccupation and Craving/Wanting
- Decreased ability to inhibit the behavior
- Switch from long term, larger gains in favor of short-term, smaller reward.
- The others result from these core symptoms:
  - Tolerance, withdrawal
  - Social isolation
  - Job loss, interpersonal problems

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Review: How Addiction Develops

- You expose the brain to high concentrations of a drug repeatedly & for significant amounts of time
- The brain changes in response, trying to maintain homeostasis (normal state)
- These changes result in dysregulation of the brain's mechanisms for controlling the intake of that particular drug

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Update: The Basic Neurobiology of Addiction

With thanks to George Koob, whose book Drugs, Addiction and the Brain, provided many of these illustrations.

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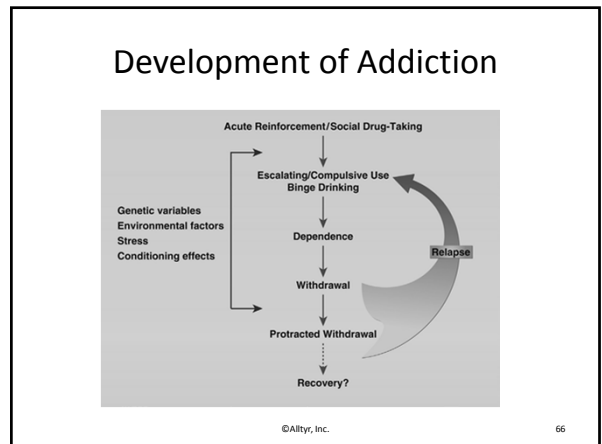
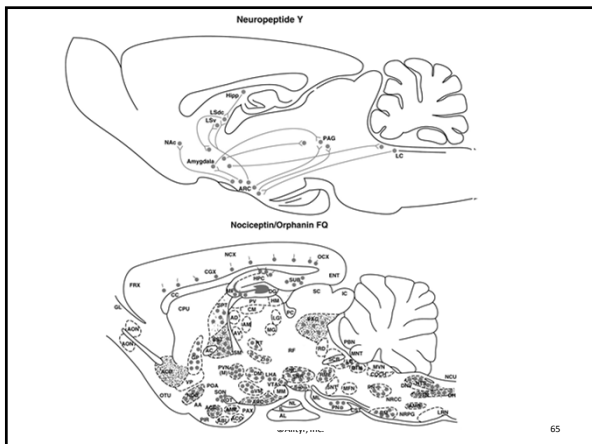
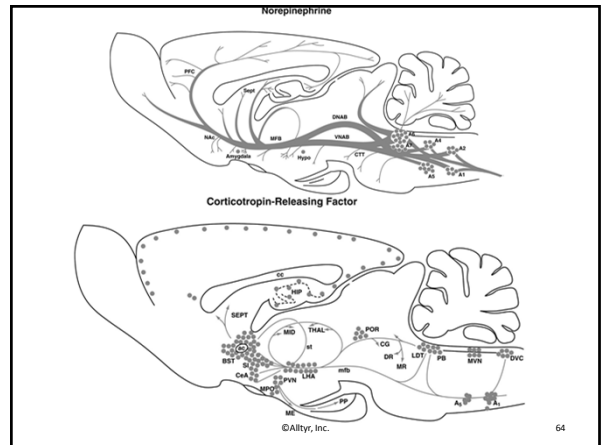
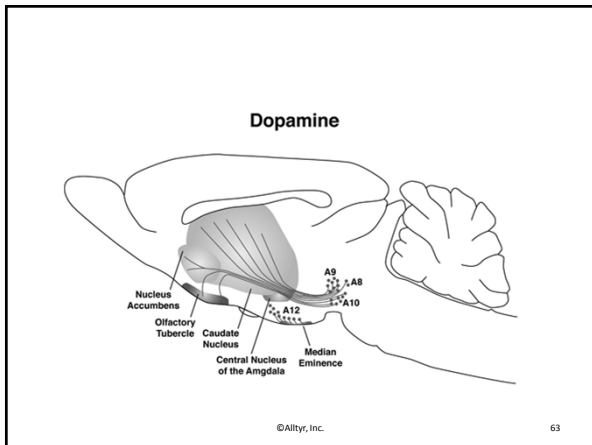
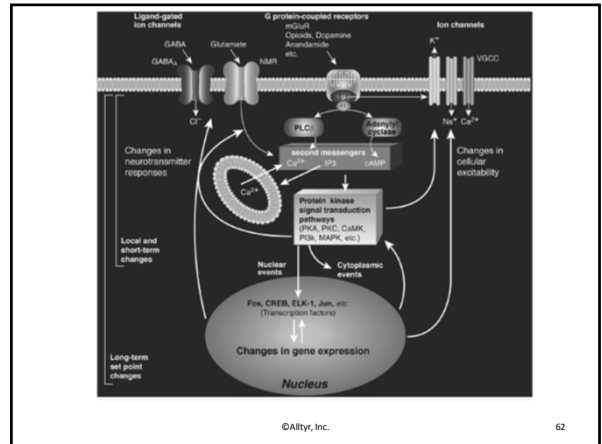
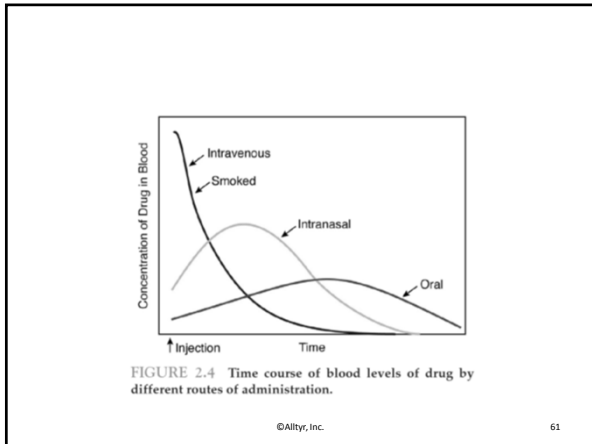
Classification of Psychotropic Drugs

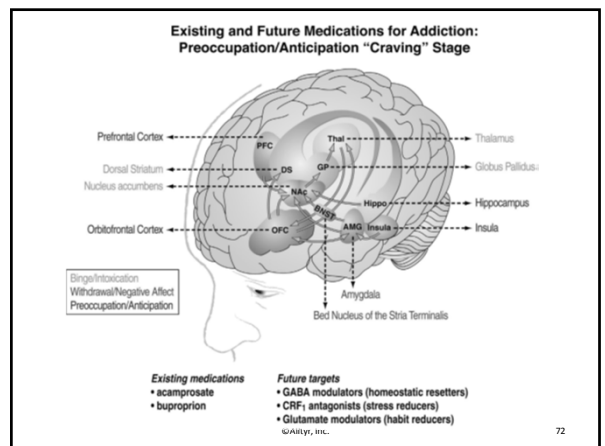
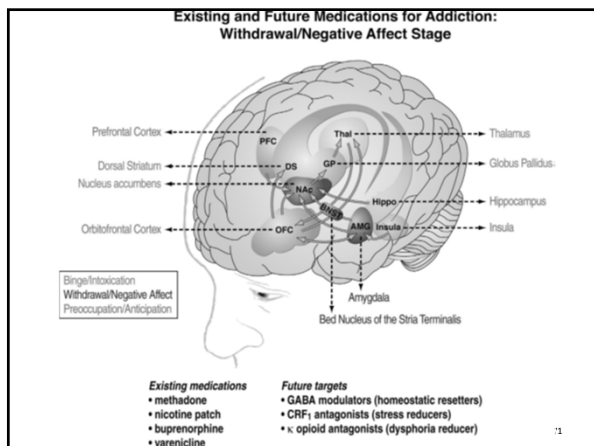
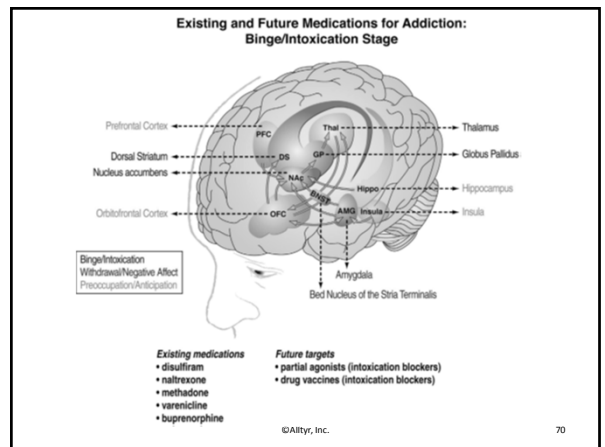
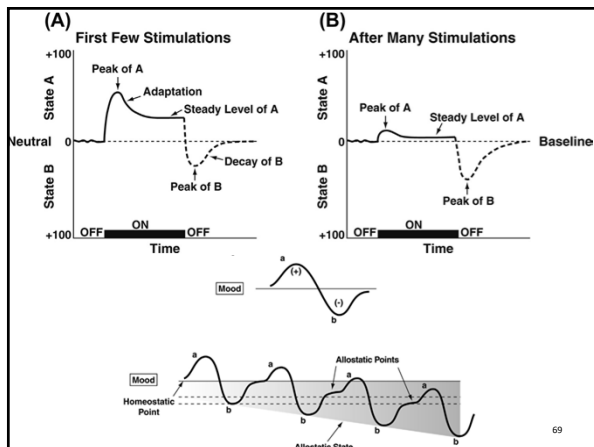
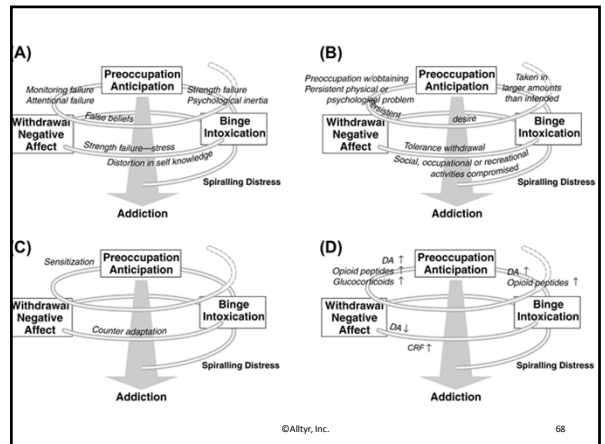
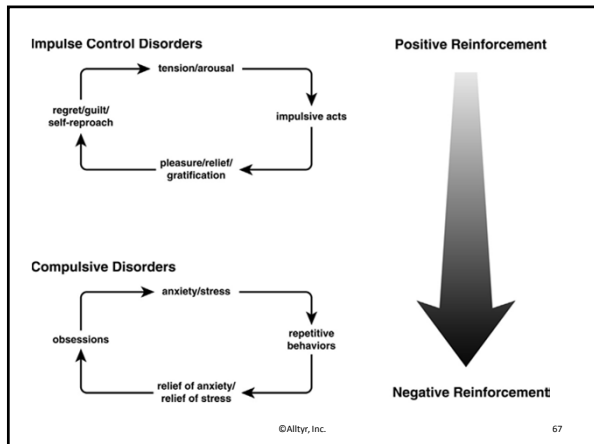
TABLE 2.1 Behavioral and Pharmacodynamic Classification of Psychotropic Drugs

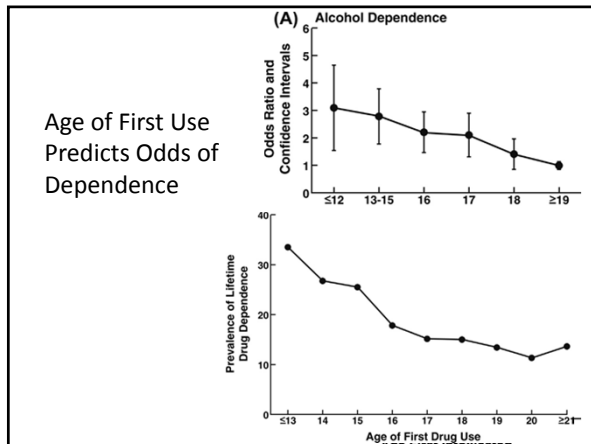
Drug Class	Examples	Neurotransmitters
Stimulants	Caffeine Nicotine Cocaine Methamphetamine	Dopamine
Opiates	Morphine Heroin Meperidine (Demerol)	Enkephalins Endorphins
Sedative/Hypnotics	Alcohol Diazepam (Valium)	GABA
Antipsychotics	Haloperidol	Dopamine
Antidepressants	Fluoxetine (Prozac)	Norepinephrine Serotonin
Psychedelics/Hallucinogens	Lysergic acid diethylamide Psilocybin Marijuana	Serotonin Glutamate Endocannabinoids

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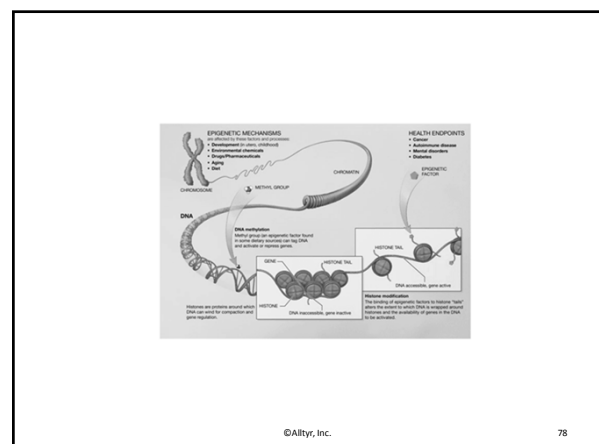


- ## DSM-IV to DSM-5
- The thinking on Substance Abuse in DSM-IV was subsequently disproved
    - It's not milder; dependence sx's develop early
    - It doesn't lead to dependence
    - Most "Abuse" symptoms occur in the most severe cases of dependence
  - DSM-5 criteria consist of 10/11 of DSM-IV criteria in one dimensional disorder
  - Legal problems were dropped; craving was added

- ## DSM-5
- Only one disorder: Substance Use Disorder
  - So, Alcohol Use Disorder, Opioid Use Disorder, Cocaine Use Disorder, etc.
  - Requires 2/11 positive criteria for a diagnosis
  - Gradations of severity:
    - 2-3 = "mild"
    - 4-5 = "moderate"
    - 6+ = "severe"

- ## DSM-5
- The number of positive criteria works pretty well as a proxy for severity of disorder
  - Population prevalence- past year
    - Effect of DSM-5 differs by substance
    - For AUD, DSM-5 prevalence = 10.8%, while DSM-IV combined Abuse-Dependence = 9.7%

- ## Genetics & Genomics
- Genetics refers to the genetic code inherited from one's parents
  - Genomics refers to a highly dynamic process
    - Genes that turn other genes on/off
    - Environmental influences affect gene expression
  - There are at least hundreds of genes involved in determining vulnerability to SUD and MH
  - Each variation contributes a tiny fraction of variability
  - Environmental influences are substantial & can cause changes in gene expression that are enduring

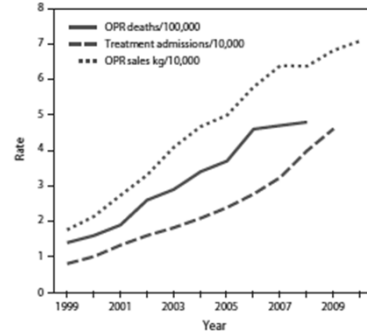


If the brain was simple enough for us to understand it, we would be too simple to.

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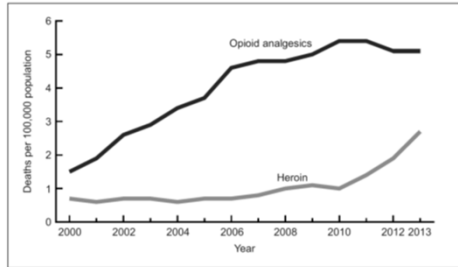
FIGURE 2. Rates\* of opioid pain reliever (OPR) overdose death, OPR treatment admissions, and kilograms of OPR sold — United States, 1999–2010



\*Age-adjusted rates per 100,000 population for OPR deaths, crude rates per 10,000 population for OPR abuse treatment admissions, and crude rates per 10,000 population for kilograms of OPR sold.

Source: CDC

Figure 1. Age-adjusted rates for drug-poisoning deaths, by type of drug: United States, 2000–2013



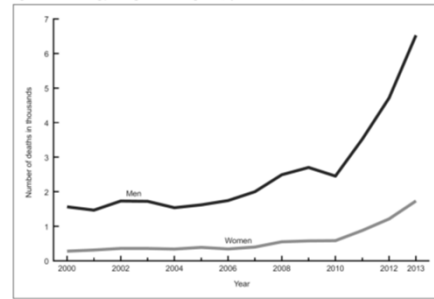
NOTES: The number of drug-poisoning deaths in 2013 was 43,982, the number of drug-poisoning deaths involving opioid analgesics was 16,235, and the number of drug-poisoning deaths involving heroin was 6,257. A small subset of 1,342 deaths involved both opioid analgesics and heroin. Deaths involving both opioid analgesics and heroin are included in both the rate of deaths involving opioid analgesics and the rate of deaths involving heroin. Access data table for Figure 1 at: [http://www.cdc.gov/nchs/data/tables/drugs130\\_tsbm.pdf#1](http://www.cdc.gov/nchs/data/tables/drugs130_tsbm.pdf#1). SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

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### In 2013, Four Times as Many Men Died as Compared to Women

Figure 2. Number of drug-poisoning deaths involving heroin, by sex: United States, 2000–2013

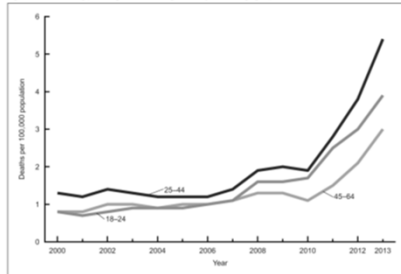


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### Large Increase in Deaths from Heroin OD in Young People, 2010 to 2013

Figure 3. Rates for drug-poisoning deaths involving heroin, by selected age groups: United States, 2000–2013



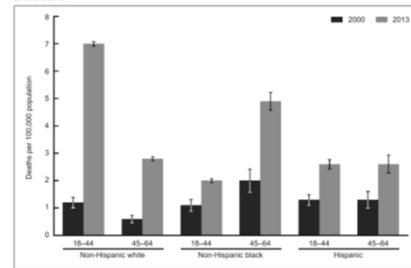
NOTE: Access data table for Figure 3 at: [http://www.cdc.gov/nchs/data/tables/drugs130\\_tsbm.pdf#3](http://www.cdc.gov/nchs/data/tables/drugs130_tsbm.pdf#3). SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

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### Massive Increase in Heroin Deaths Among Young Whites, 2000 to 2013

Figure 4. Rates for drug-poisoning deaths involving heroin, by selected age and race and ethnicity groups: United States, 2000 and 2013



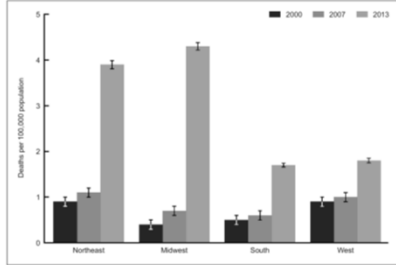
NOTE: Deaths for Hispanic persons are underreported by about 5%. See "Deaths: Final Data for 2010." Access data table for Figure 4 at: [http://www.cdc.gov/nchs/data/tables/drugs130\\_tsbm.pdf#4](http://www.cdc.gov/nchs/data/tables/drugs130_tsbm.pdf#4). SOURCE: CDC/NCHS, National Vital Statistics System, Mortality.

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## Largest Increase in Heroin Deaths in the Midwest, 2007 to 2013

Figure 5. Age-adjusted rates for drug-poisoning deaths involving heroin, by census region: United States, 2000, 2007, and 2013.



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## Prescription painkillers sold by state per 10,000 population (2010)

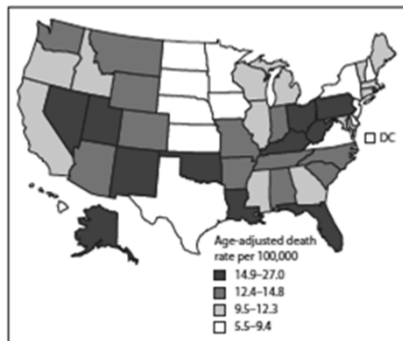


- 12.6 = Florida
- 11.8 = Tennessee, Nevada
- 11.6 = Oregon
- 10.2 = Delaware
- 9.8 = Maine
- 9.7 = Alabama
- 9.2 = Washington, Oklahoma
- 9.0 = Kentucky
- 8.1 = Michigan
- 7.9 = Ohio
- 7.5 = Idaho
- 7.2 = Missouri
- 6.5 = Wisconsin
- 6.2 = California
- 5.5 = South Dakota
- 5.0 = North Dakota
- 4.6 = Iowa
- 4.2 = Minnesota
- 3.9 = District of Columbia
- 3.7 = Illinois

SOURCE: Automation of Reports and Consolidated Orders System (ARCOS), US Drug Enforcement Administration (DEA), 2010

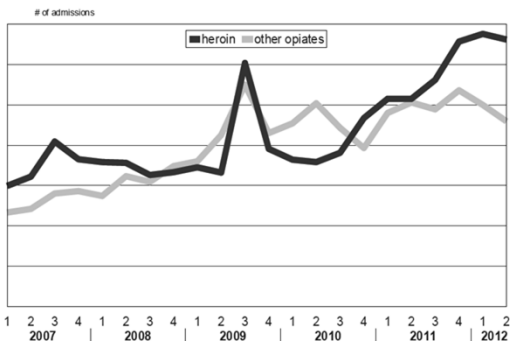
US overall = 7.1

## Prescription Opioid Death Rates, 2008



Source: CDC

## Number of Twin Cities treatment admissions with heroin and other opiates as primary substance problem: 2007 through June 2012 (by quarter)



SOURCE: Drug and Alcohol Abuse Normative Evaluation System (DAANES), Minnesota Department of Human Services, 2012.

## Treatment of Opioid Addiction

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## Resources

- Clinician's Guide + Video cases  
[www.niaaa.nih.gov/guide](http://www.niaaa.nih.gov/guide)
- Rethinking Drinking  
[www.rethinkingdrinking.niaaa.nih.gov](http://www.rethinkingdrinking.niaaa.nih.gov)
- Pain materials  
[www.pain.edu](http://www.pain.edu)
- Suboxone for opioid dependence  
[www.pcscsb.org/](http://www.pcscsb.org/)

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