

# Debunking Marijuana Myths

ENTERHEALTH

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ADDICTION TREATMENT

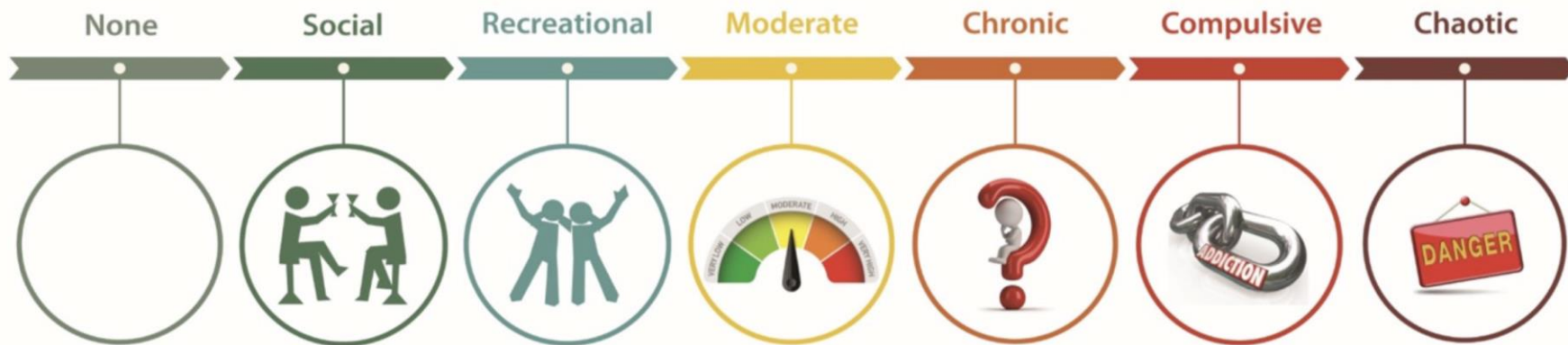
Harold C. Urschel III, MD, MMA

March 7, 2018

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# ADDICTION IS A SPECTRUM DISORDER

Alcohol and drug use falls along a spectrum



# THE ADOLESCENT BRAIN

STILL UNDER CONSTRUCTION

Prefrontal  
Cortex

Striatum

Amygdala



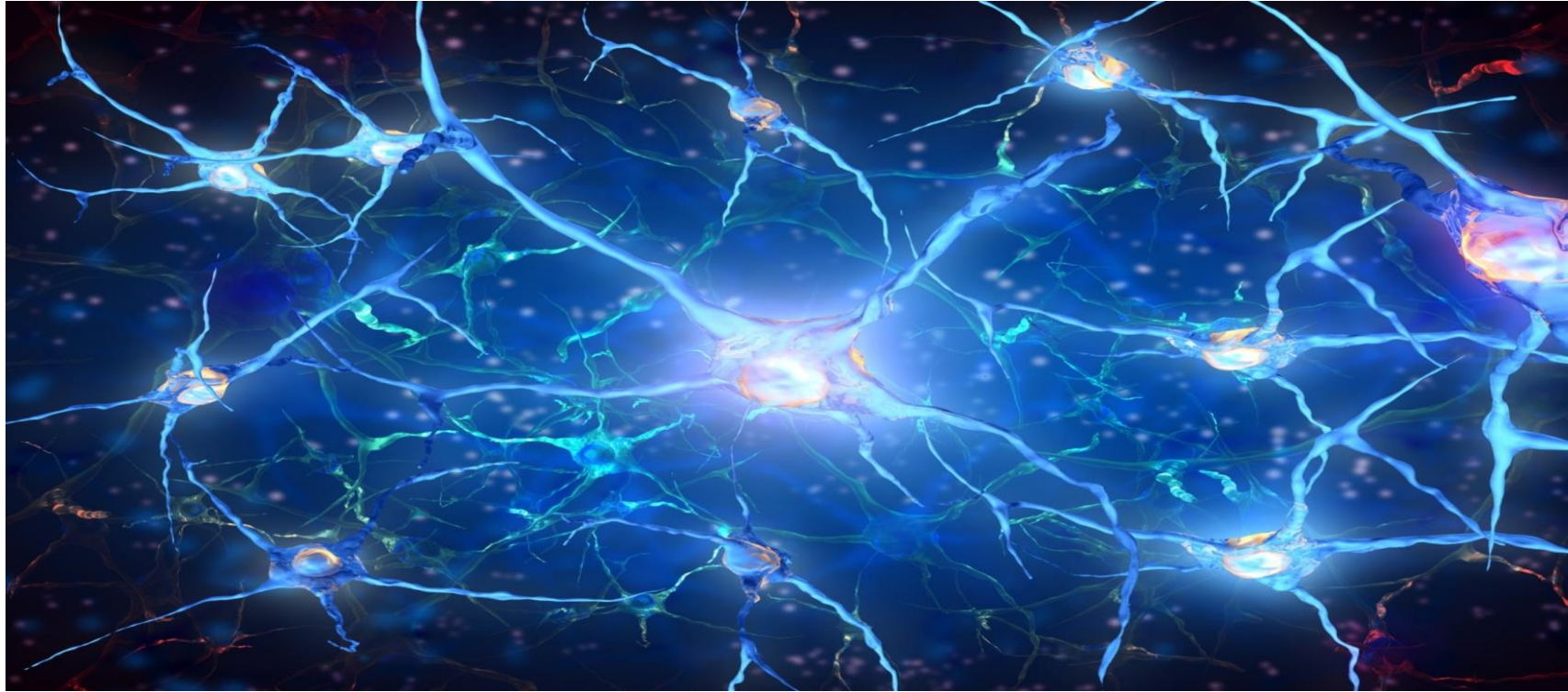
# ADDICTION IS A SPECTRUM DISORDER

- For children, teenagers and young adults, brain injury occurs all along the spectrum of use
- From early adolescence to mid-20s, a young adult's brain develops unevenly – from back to front – which is why they often have quirky behavior and are more predisposed to risk-taking

## Dynamic mapping of human cortical development



# THE BRAIN CELL: NEURON





# SYNAPSE: WHERE THE ACTION IS



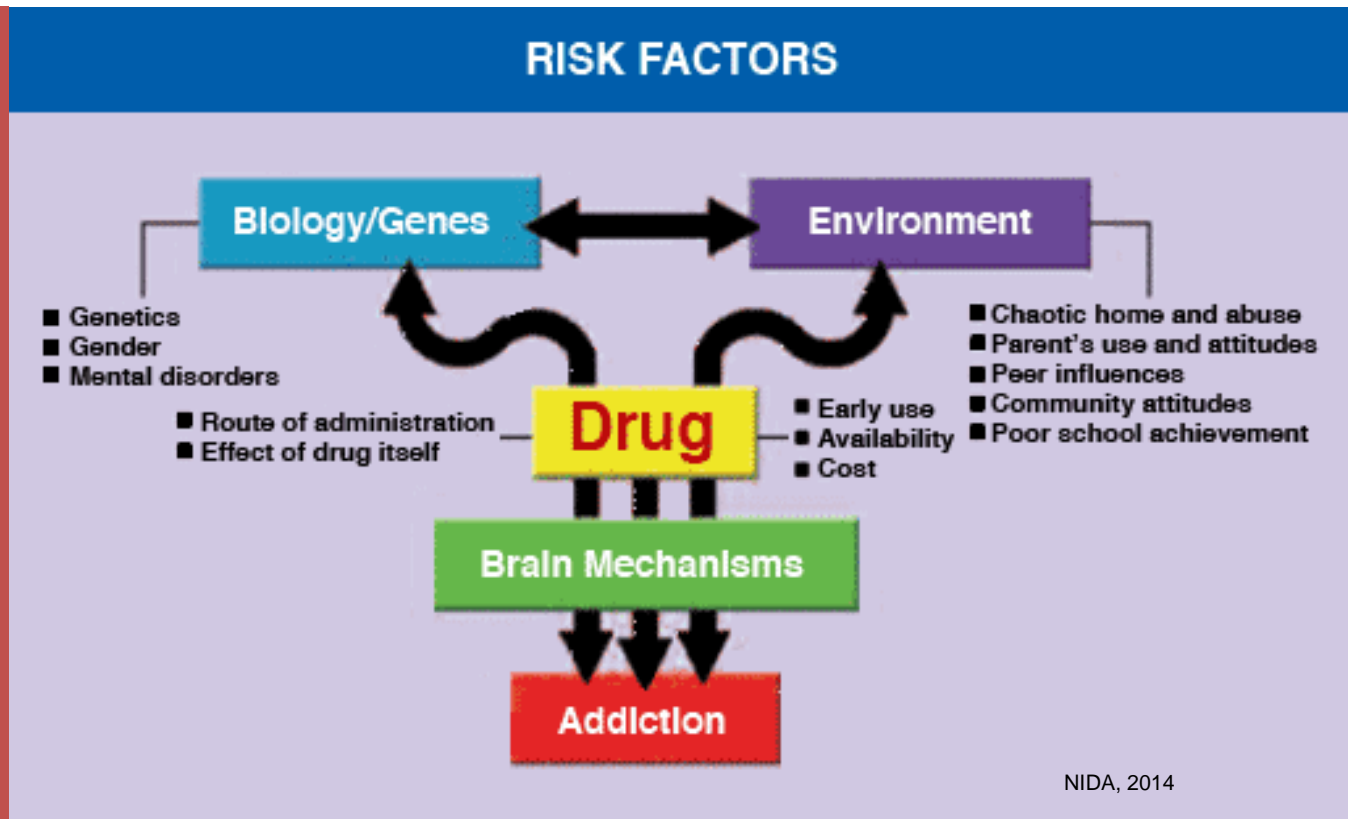
# WHAT DOES USING WEED COST YOU?



- Changes your brain – lowers your “horsepower”
- Decreases academic performance
- Legal issues
- Impacts college acceptance/success
- Lost opportunities – scholarships, sports, jobs
- Increases likelihood of an unplanned pregnancy and/or STDs

# WHO GETS ADDICTED?

- Alcohol/drug addiction is a complex disorder - many factors act together to produce illness
- Approximately 50% of risk attributed to genetics
- Addiction can arise without any apparent family history of dependence
- Different Genetic Subtypes of Addiction to Alcohol – 12 different genetic subtypes

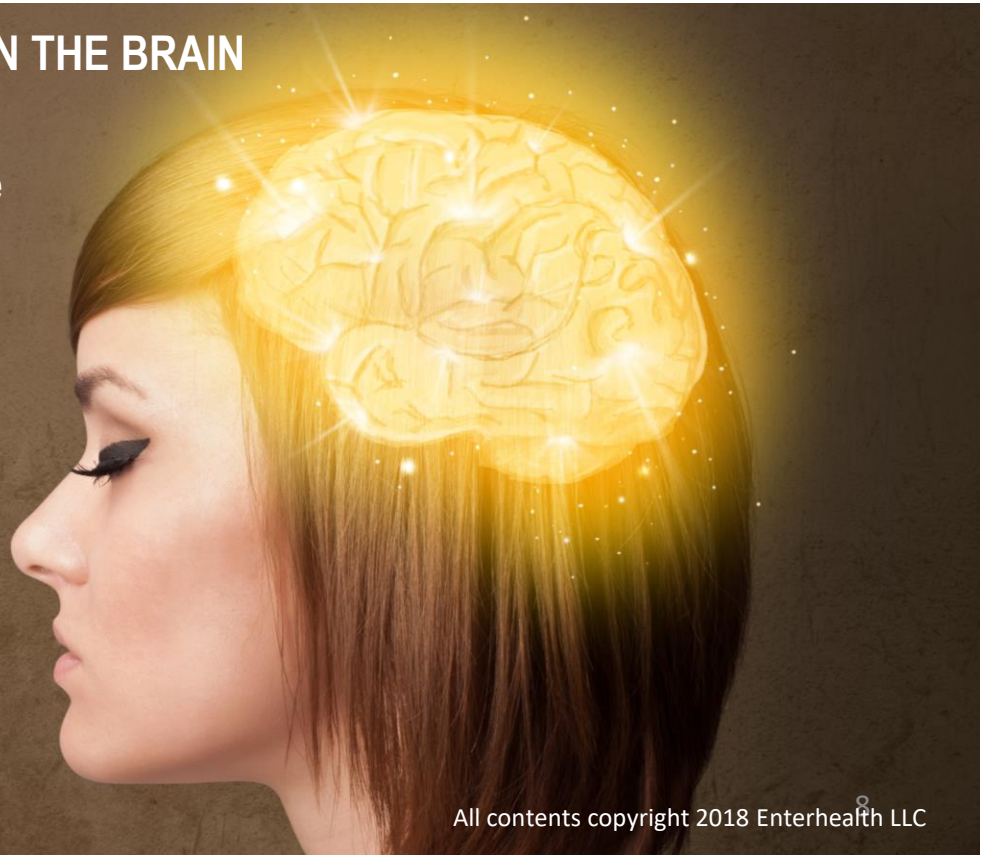




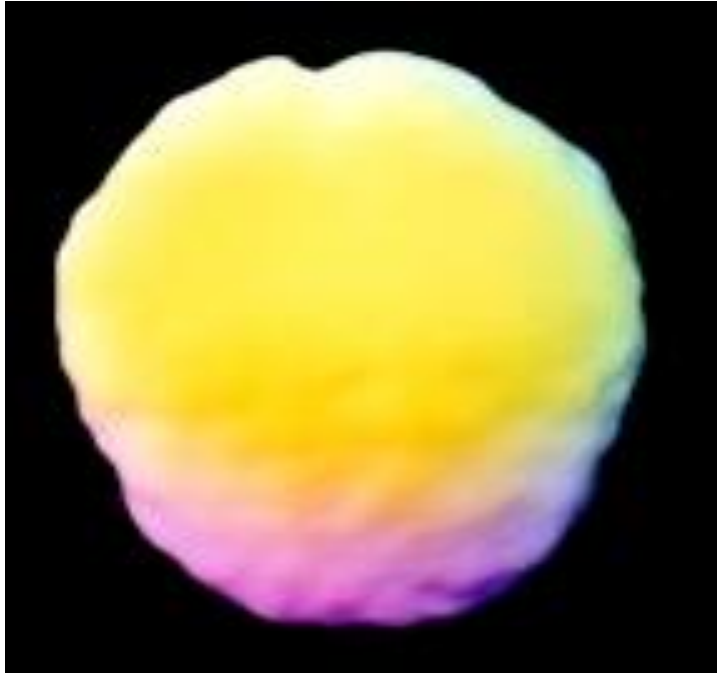
# ALCOHOL AND DRUG ADDICTION

## A CHRONIC DISEASE THAT RESIDES IN THE BRAIN

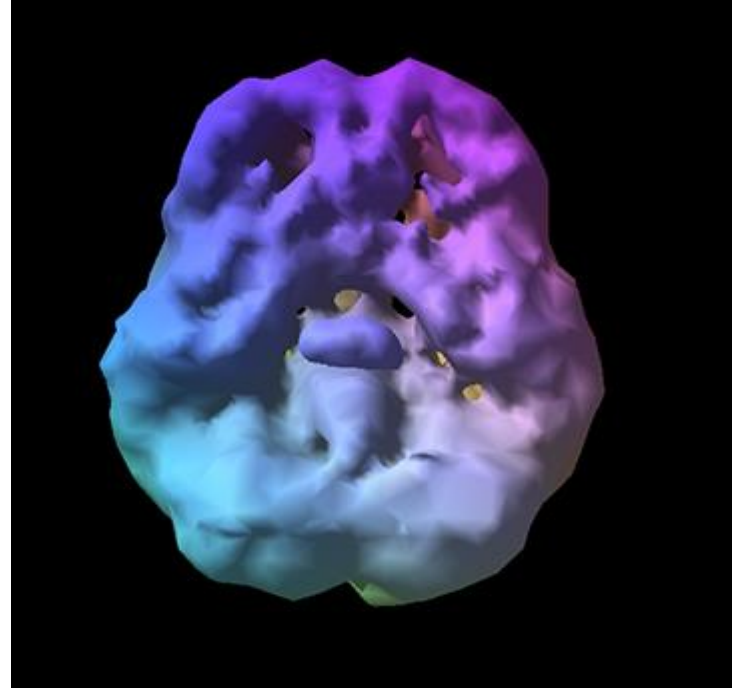
- Addiction is not the result of moral failure or weakness
- Addiction is essentially traumatic brain injury (not damage)
- With proper treatment, the chances for successful recovery is high
- The negative impact of drug and alcohol use on teens is significant



# A CHRONIC BRAIN DISEASE



Normal Brain

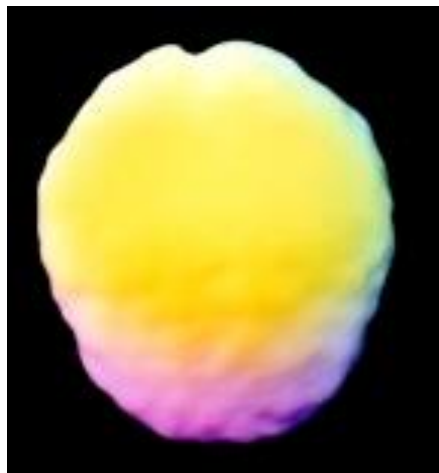


Marijuana Abuse

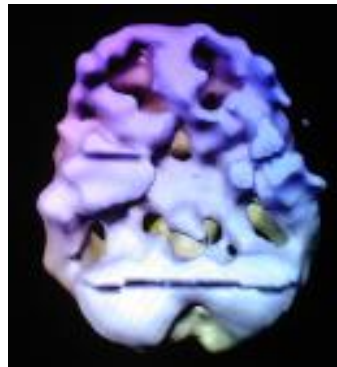
Courtesy of Daniel Amen, M.D.

# ALCOHOL AND THE BRAIN

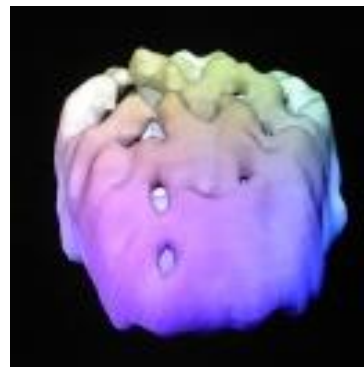
Drug and alcohol use creates profound changes in brain metabolism



Normal



Underside  
surface



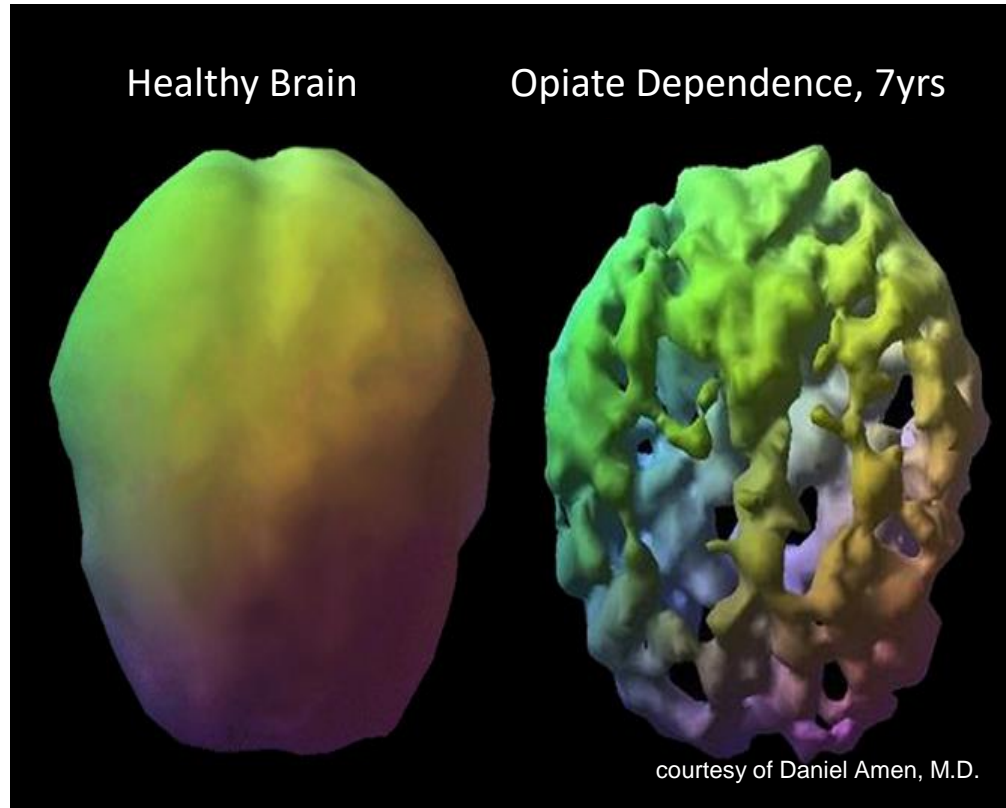
Front-on  
surface



Right side surface

38-year-old male with 17 years of heavy weekend alcohol use displays a significant decrease in brain activity

# A CHRONIC BRAIN DISEASE

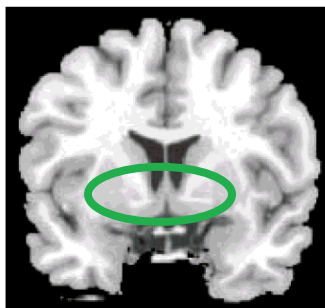


# Brain Neuroscience

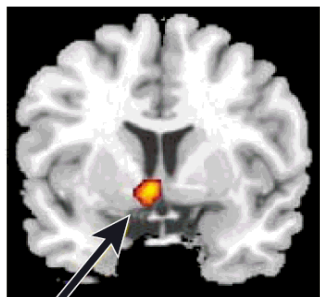
## f MRI images of brain's reward system

- Social drinkers
- Neutral cues vs. Alcohol cues
- Alcohol dependent (non-treatment seeking)

Social Drinkers



Alcohol Dependent  
Individuals





# DUAL DISORDERS

Substance abuse and addiction is often the result of or a part of other behavioral health disorders

- Depression
- Anxiety disorder
- Bipolar disorder
- Schizophrenia
- ADD/ADHD
- PTSD

**DRUG  
ADDICTION**



**MENTAL  
ILLNESS**

# MARIJUANA BASICS

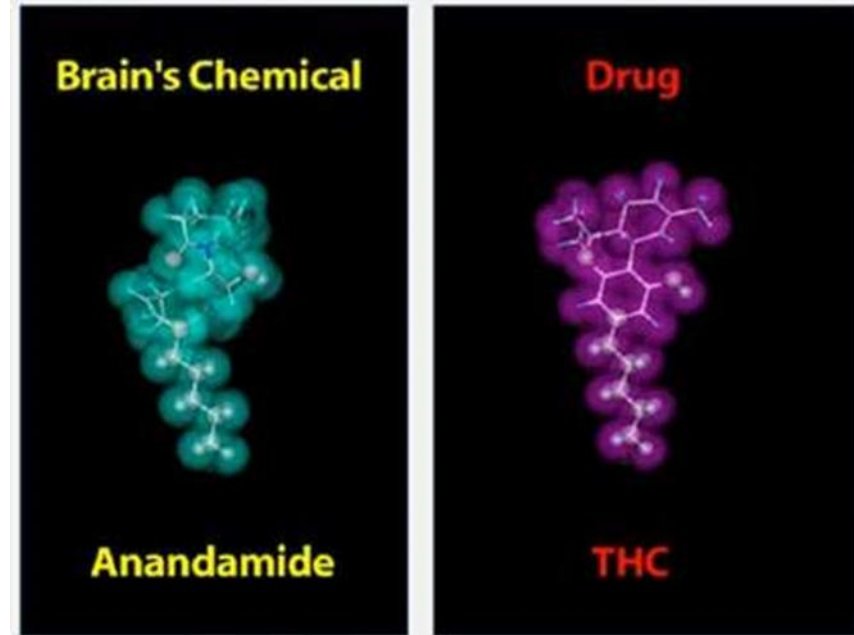


# MARIJUANA BASICS

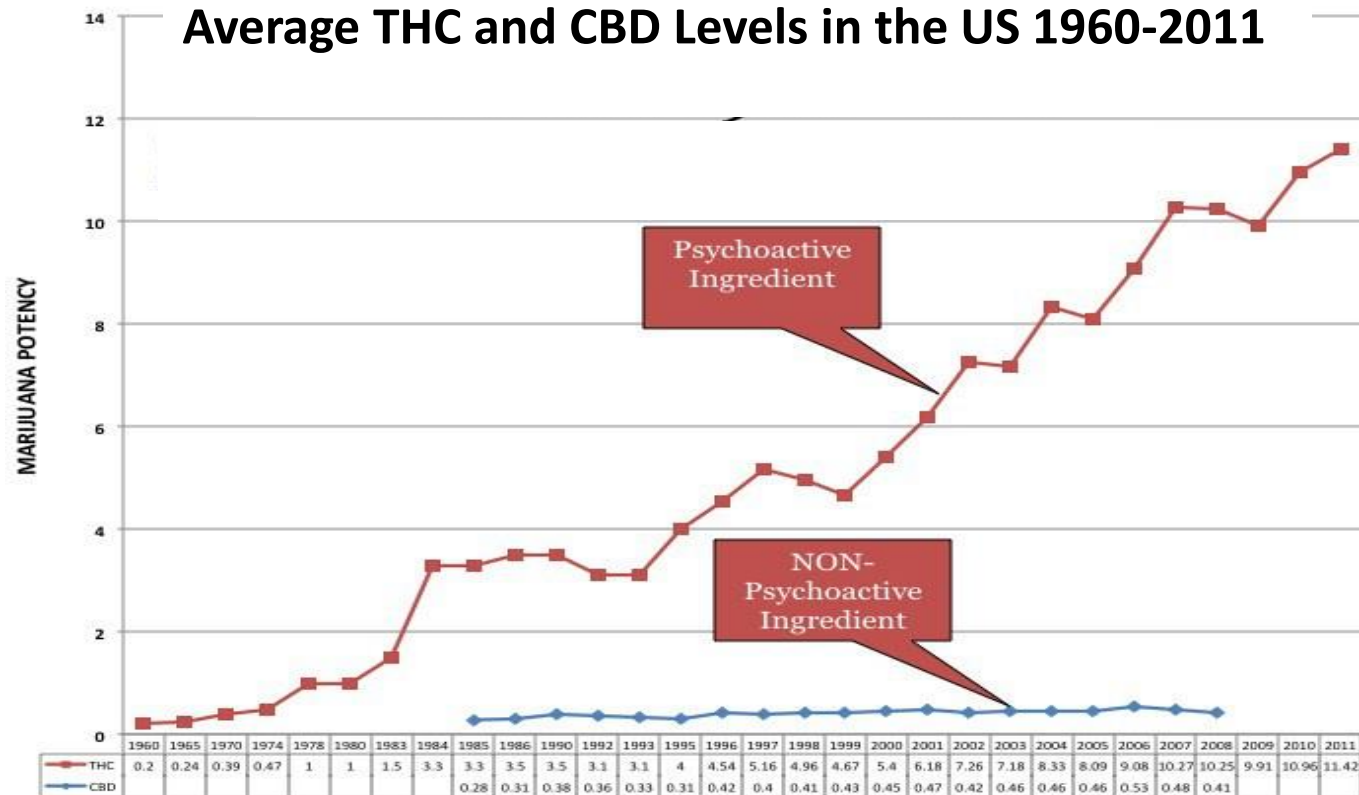
Anandamide is taken from the Sanskrit word ananda, which means “joy, bliss, delight”.

Anandamide plays a role in the regulation of feeding behavior, and the neural generation of motivation and pleasure.

Anandamide is an endogenous analogue of tetrahydrocannabinol.



# MARIJUANA BASICS



# MARIJUANA BASICS

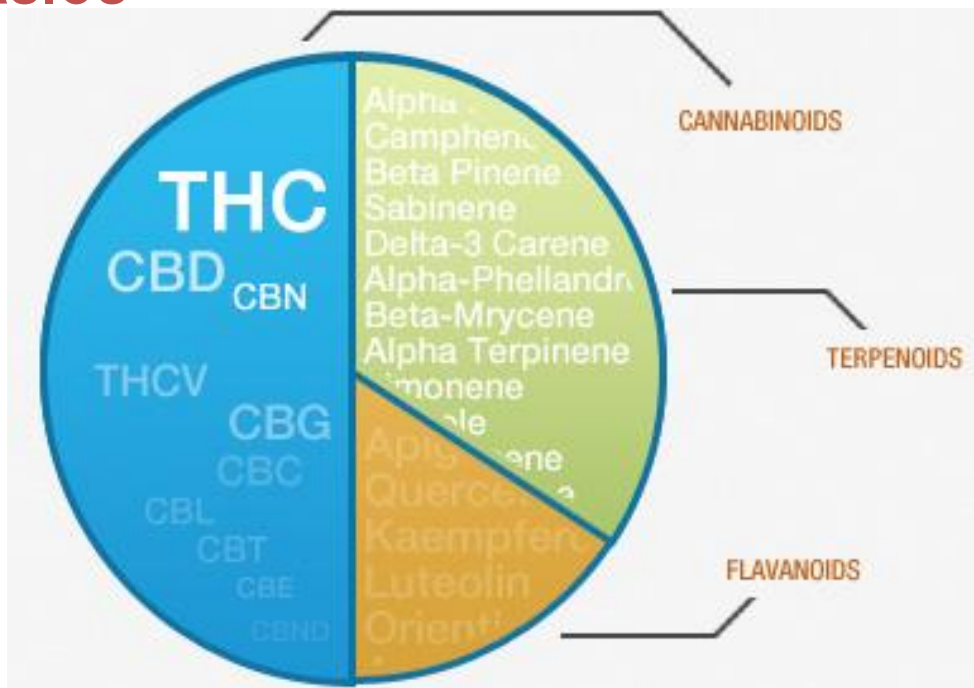


Today's pot is  
now about  
**275%**  
more potent than  
it was  
10 years ago



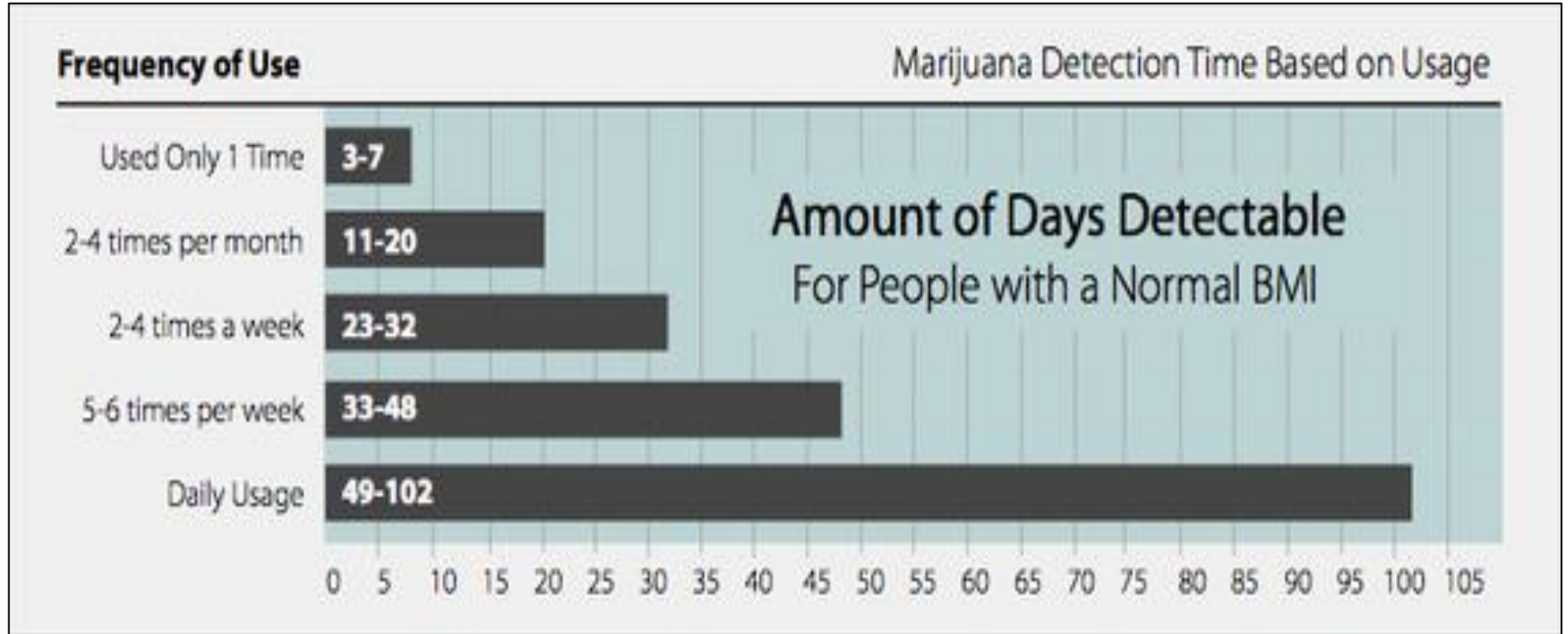


# MARIJUANA BASICS



There are 250 different substances in marijuana smoke; THC is only one of them

# MARIJUANA DETECTION TIME



# Cannabis Use Disorders are Skyrocketing in the United States

- Marijuana has more than doubled since 2001, with nearly 10 percent of adults across the country reporting marijuana use in 2013.
- The percentage of people reporting dependence or abuse of marijuana also doubled, from 1.5 percent in 2001 to nearly 3 percent in 2013.
- Among marijuana users, the report found that 3 out of every 10 people, or nearly 7 million Americans, have a marijuana abuse or addiction problem.
- The biggest increases in marijuana abuse and dependence was found among middle-aged or older adults, women, African-Americans, Hispanics and people living in the southern U.S.

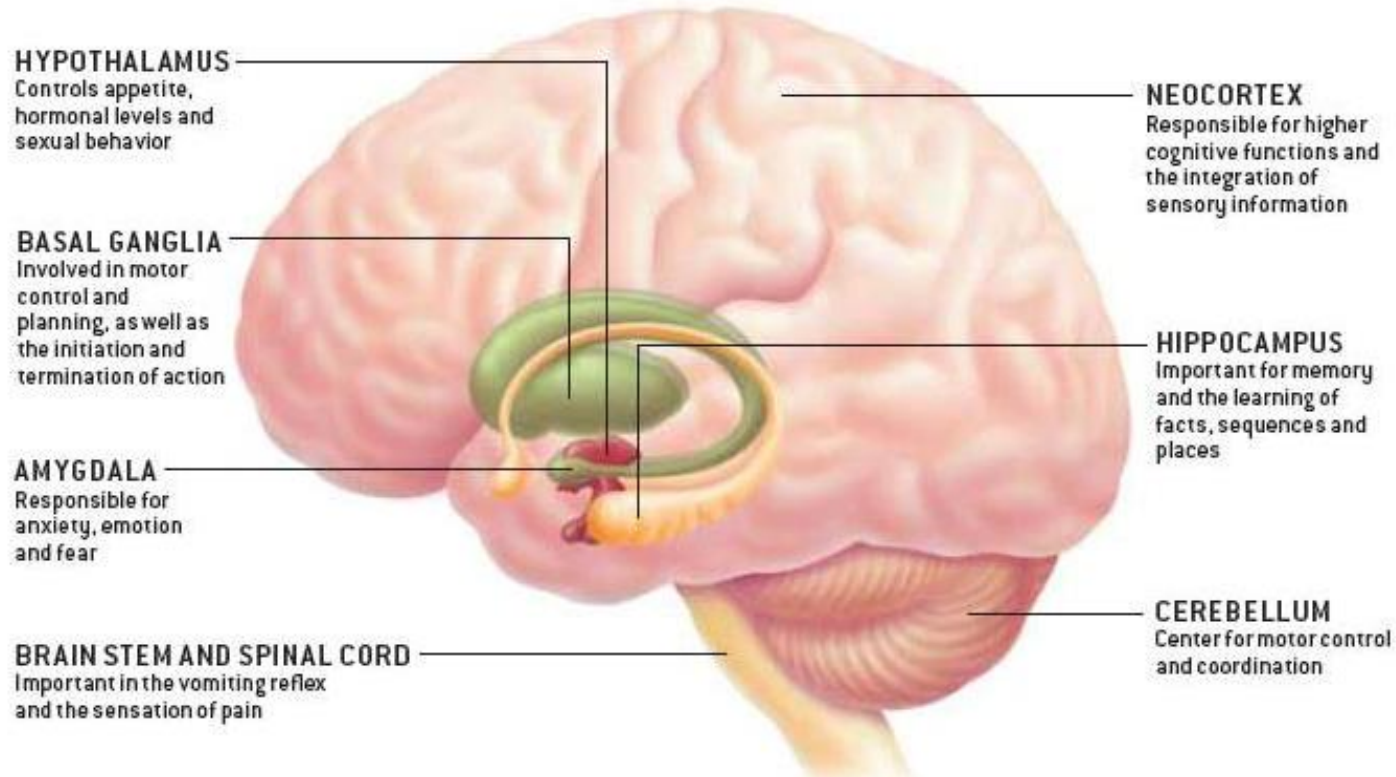


Prevalence and Correlates of DSM-5 Cannabis Use Disorder, 2012-2013: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions-III," was published in the *American Journal of Psychiatry* JAMA Psychiatry

# MARIJUANA AND THE BRAIN



# MARIJUANA AND THE BRAIN





# MARIJUANA AND THE BRAIN

MOST MARIJUANA USE BEGINS IN  
**ADOLESCENCE**



**78%**

of the 2.4 million people who  
began using in the last year  
were aged 12 to 20.<sup>1</sup>

As perception of harm  
decreases...



teen  
marijuana  
use increases.<sup>2</sup>

**EVERY DAY,  
3,287 TEENS  
USE MARIJUANA  
FOR THE  
FIRST TIME<sup>1</sup>**

1. 2014 National Survey on Drug Use and Health (NSDUH & SAMHSA)

2. 2. MTF Survey

# MARIJUANA USE

Monitoring the Future Study:  
**Trends in Prevalence of Marijuana**  
for 8th Graders, 10th Graders, and 12th Graders - 2015

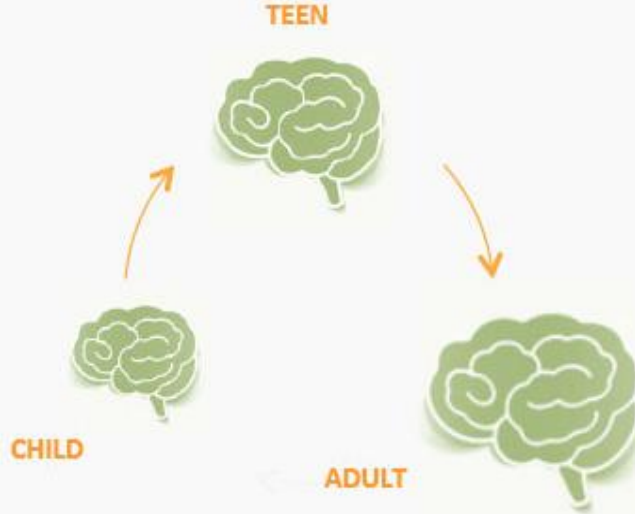
Drug	Time Period	8th Graders	10th Graders	12th Graders
Marijuana/ Hashish	Lifetime	16%	31%	45%
	Past Year	12%	25%	35%
	Past Month	7%	15%	21%
	Daily	1%	3%	6%

2015 Monitoring the Future Study, National Institutes of Health

# MARIJUANA AND THE BRAIN

## MARIJUANA MAY HURT THE DEVELOPING TEEN BRAIN

The teen brain  
is **still**  
**developing**  
and it is  
especially  
vulnerable to  
drug use.



**IQ**  
↓

Regular heavy  
marijuana use by  
teens can lead to  
an IQ drop of up to  
**8 points<sup>3</sup>**

2015 Kari Franson, Associate Dean for Professional Education, Skaggs School of Pharmacy, University of Colorado

# MARIJUANA AND THE BRAIN

## HEAVY MARIJUANA USE BY TEENS IS LINKED TO<sup>4</sup>:

### Educational Outcomes



**lower**  
grades and  
exam scores



**less** likely  
to graduate  
from HS or  
college



**less** likely  
to enroll in  
college

### Life Outcomes



**lower**  
satisfaction  
with life



**more**  
likely to be  
unemployed



**more** likely to  
earn a **lower**  
income



National Institute  
on Drug Abuse

1. NSDUH, SAMHSA, 2014; 2. MTF Survey; 3. Meier et al 2012; 4. MTF Survey; Cobb-Clark et al, 2013; Silins et al 2014; Tucker et al 2005; Homel et al, 2014; Volkow et al 2014; Fergusson and Boden 2008; Brooks et al 2013

# WHAT ARE YOU SMOKING?

## How do you know what you are really smoking?

- Drug dealers have no quality control.
- Do drug dealers have YOUR best interests at heart?
- How do you know what they are selling you is really weed?
- If it is weed, how strong is it? What dose are you using?
- Is it mixed with anything? Cocaine, PCP, Formaldehyde, Fentanyl...
- Where has it been before you get it?
- What is growing on it?
- Would you feel comfortable doing this with other foods?



# MYTHS OF MEDICAL MARIJUANA

- Marijuana CANNOT be prescribed legally in any state – it is only recommended
- In marijuana, the THC and the CBD are the two compounds that are the “medicinal part”
- THC/CBD has been shown to be helpful in the following areas:
  1. Nausea
  2. Increase appetite
  3. Seizure
  4. Glaucoma
  5. Pain

# MYTHS OF MEDICAL MARIJUANA

Not shown to be helpful in the following areas:

1. Sleep
2. Anxiety
3. PTSD

Marinol – pill form of pure THC – legal and insurance covers it

Inability to focus on tasks or handle stressful situations

CDB is almost FDA-approved in pill form

FDA will NEVER approve MJ (solid state to a gaseous state) no way to know dose

# CURRENT TRENDS IN MARIJUANA RESEARCH



# NO NEED FOR DIRECTIONS

Washington State  
airport has  
convenient  
shuttles to legal pot  
every 20 minutes via  
the “CannaBus  
Shuttle.”



Photo courtesy of Elle Lockhart, PhD.



# CURRENT MARIJUANA RESEARCH

Emergency  
room visits  
double for  
Colorado  
marijuana  
tourists

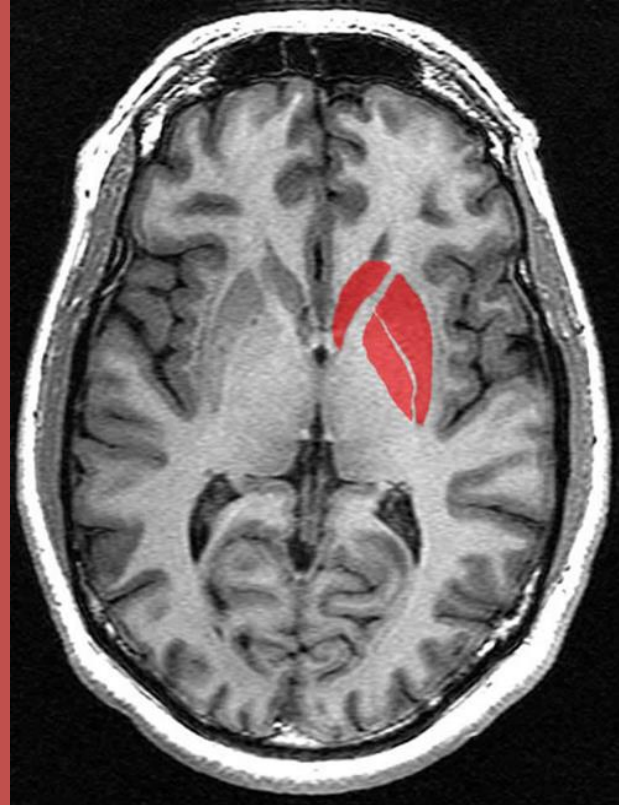


# CURRENT MARIJUANA RESEARCH

## Heavy Cannabis Use Associated With Reduced Dopamine Release

Cannabis users had significantly lower dopamine release in the striatum, including subregions involved in associative and sensorimotor learning, and in the globus pallidus.

“Deficits in striatal dopamine release in cannabis dependence,” was published online on March 22, 2016, in *Molecular Psychiatry*

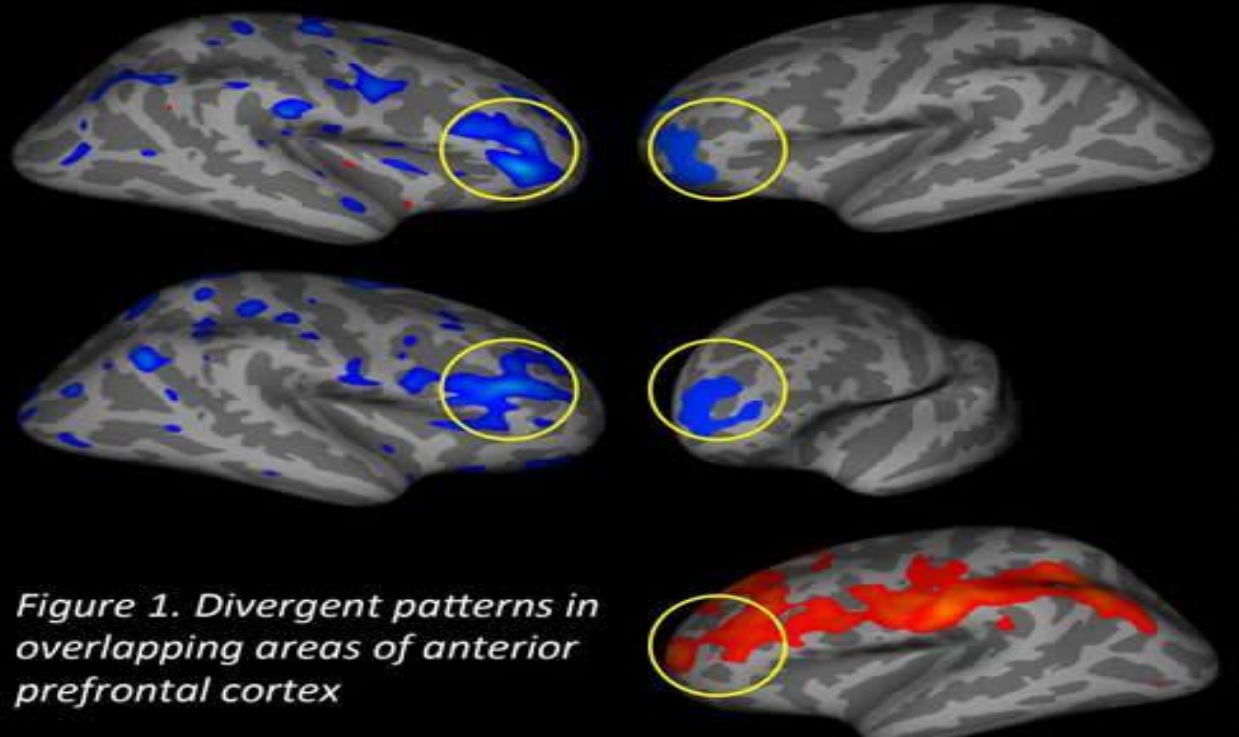




# CURRENT MARIJUANA RESEARCH

Participants who began using marijuana at age 16 or younger demonstrated brain variations indicating arrested development in the prefrontal cortex, the part of brain responsible for judgment, reasoning and complex thinking

Marijuana shown to stop “pruning of neurons”, which is important for gaining knowledge.



Developmental “Early Marijuana Use May Have Long Term Effects on Brain Development,” University of Texas at Dallas, published in *Developmental Cognitive Neuroscience* – February 2016.

# RESEARCH SHOWS MARIJUANA = GATEWAY DRUG



Study Links Marijuana Use  
to Greater Risk for Developing  
Addiction to Other Drugs

JAMA Psychiatry, 2016

# CURRENT MARIJUANA RESEARCH

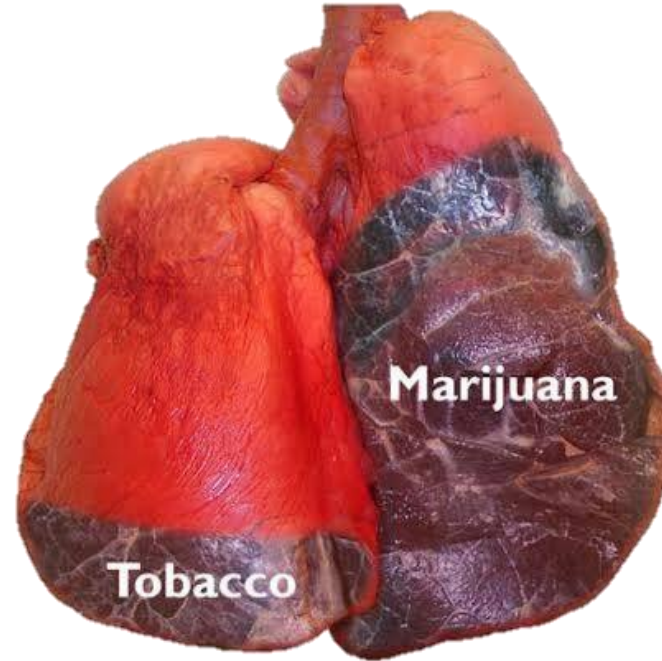
Smoking “a lot” of cannabis  
can permanently damage short  
term memory, researchers  
confirm

JAMA Internal Medicine, February 2016,  
National Survey on Drug Use and Health  
(NSDUH)



# HOW MARIJUANA AFFECTS YOUR BODY

The smoke from a marijuana cigarette is 4X MORE carcinogenic than smoke from a tobacco cigarette and it deposits 4X as much tar





# HEART ATTACK, STROKE RISK & GENERAL HEALTH

- Marijuana increases heart rate by 20% - 100% creating 5-fold increase in risk within first hour of smoking
- Smoking pot may more than double risk of stroke\*
- Marijuana may trigger strokes in young adults\*
- It can weaken the immune system and cause internal organ damage
- Causes weight gain
- Can cause respiratory problems



\*International Stroke Conference., 2013-P. Alan Barber, MD, PhD; University of Auckland

# MARIJUANA SIDE EFFECTS

## Marijuana **impacts** mental health

- 40% greater risk of psychosis when using at age 15 or earlier
- Worsens Anxiety/PTSD disorders
- Can impact social connection
- Researchers still think cannabis can trigger schizophrenia in people predisposed to the disease





# MARIJUANA SIDE EFFECTS

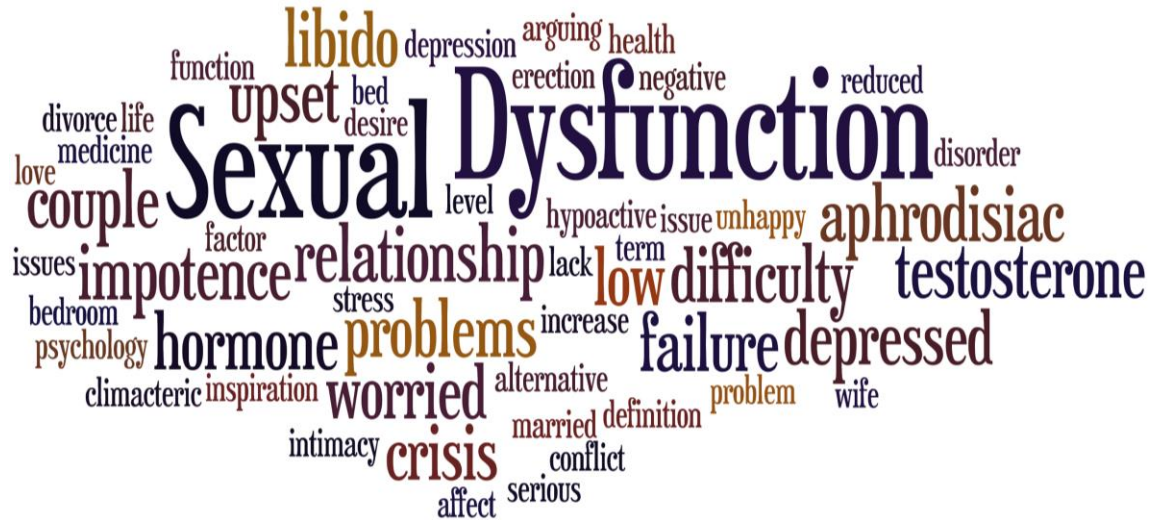
Marijuana **causes cognitive dysfunction**

- Impaired short-term memory
- Difficulty with complex tasks
- Difficulty with learning that lasts days or weeks after getting high
- Academic failure and lower long-term professional achievement



# SEXUAL SIDE EFFECTS OF MARIJUANA

- Changes in sex drive
- Increased risky behavior
- Fertility implications
- Decreased sperm count and motility
- Altered hormone levels
- Sexual dysfunction caused by shrinking testicles



# MARIJUANA WITHDRAWAL

Marijuana addiction is linked to a withdrawal syndrome that can make it hard to quit



Symptoms include:

- Irritability
- Craving
- Anxiety
- Sleeping difficulties
- Increased aggression

# ANTI-ADDICTION MEDICATIONS FOR MARIJUANA?



- There are no anti-addiction medications specifically for marijuana, many candidates are in research trials
- Medication options that can reduce anxiety and enhance sleep (no addictive potential):  
Quetiapine (Seroquel), Trazodone (Desyrel), Hydroxyzine (Vistaril) and SSRIS's and SNRIs

# THE MARKETING OF MARIJUANA

EDIBLE





# SYNTHETIC CANNABINOIDS

## Synthetic THC?

- Synthetic Marijuana - more potent than regular marijuana; multiply all of the risks by a factor of 10 to get overall risk of experimenting with either of these drugs
- Side effects include: intoxication, withdrawal, psychosis, coma, suicide attempts and even death
- Acute kidney injury





# **A Revolutionary Approach to Managing the Brain Disease of Addiction**

**USE THE SCIENCE!**

# COMPREHENSIVE SCIENCE-BASED ADDICTION TREATMENT

Addiction requires a multi-dimensional treatment approach to help sustain long-term sobriety

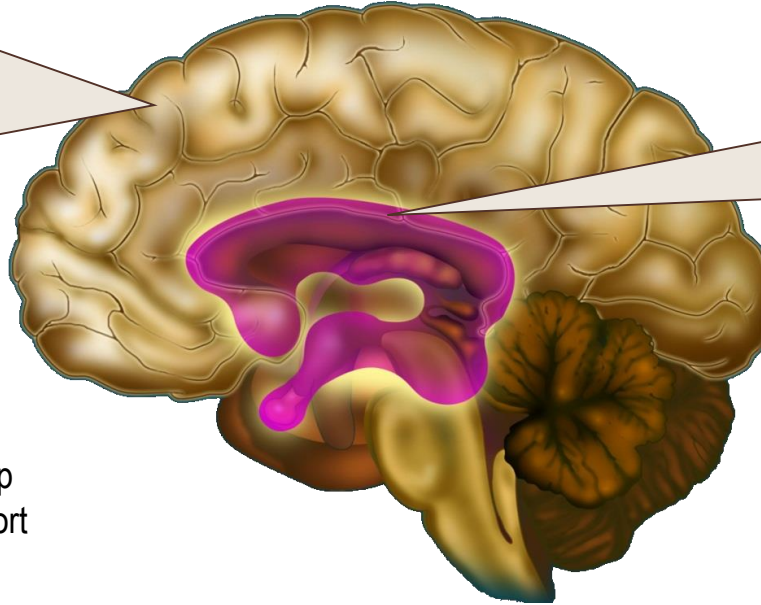
## Cortex

### Role:

- Decision Making
- Thinking & Reasoning
- Rationalizing

### Therapy:

- Individual, Family, Group
- AA / SMART Recovery Fellowship
- Faith-based Guidance and Support
- Trauma, Stress Management
- Nutrition and Wellness



## Limbic Region

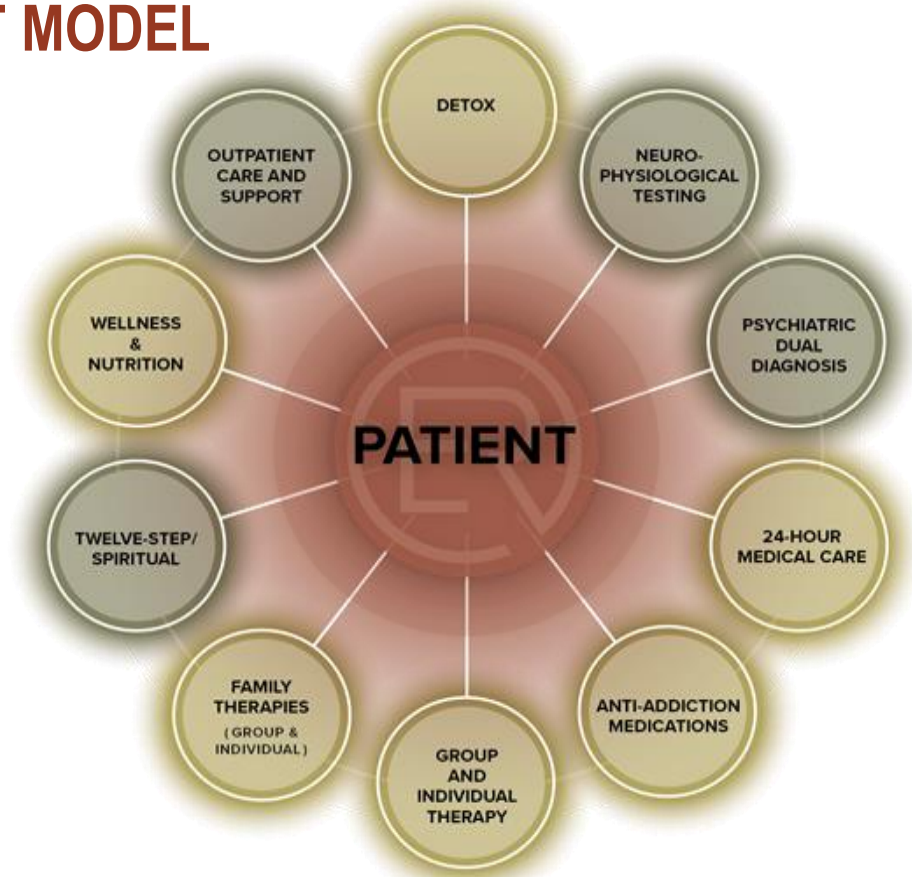
### Role:

- Drive generation

### Therapy:

- Anti-addiction medication(as needed)
- Dual disorder medication (as needed)

# NIH TREATMENT MODEL



## CLOSING THOUGHTS

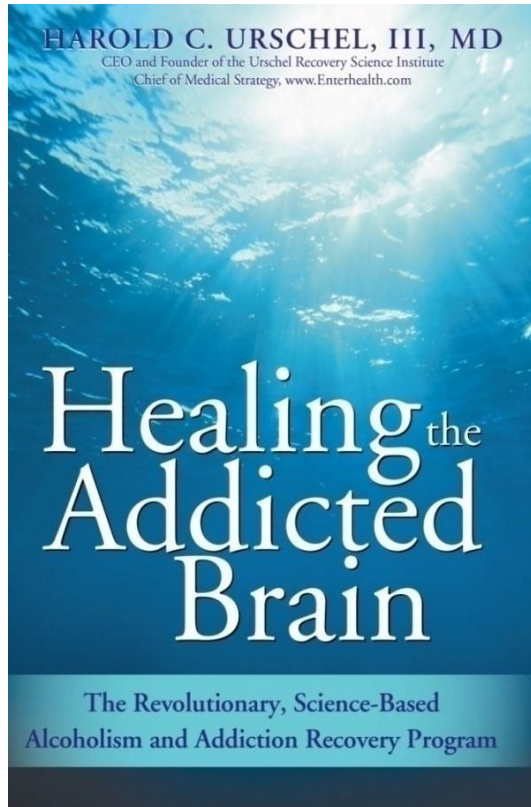
- A teen's brain is significantly injured even with infrequent marijuana use
- Alcohol and drug addiction is a chronic, medical disease and causes significant brain injury
- Marijuana is addicting and potentially life-threatening when used frequently
- Marijuana addiction is very treatable
- It takes a minimum of 4-18 months of complete sobriety for the brain to heal

# RESOURCES

For additional information on any of the topics today, please visit:

- [www.enterhealth.com](http://www.enterhealth.com) – assessments/educational info
- [www.drugfree.org](http://www.drugfree.org) – for parents and kids
- [www.timetotalk.org](http://www.timetotalk.org) – for parents and kids
- <http://parent.drugfree.org> – for parents
- [www.nida.nih.gov](http://www.nida.nih.gov) – for parents
- [www.niaaa.nih.gov](http://www.niaaa.nih.gov) – for parents

# RESOURCES



For a free e-copy of Chapter One  
of Healing the Addicted Brain visit  
[www.enterhealth.com](http://www.enterhealth.com)

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# Questions & Answers

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March 7, 2018