

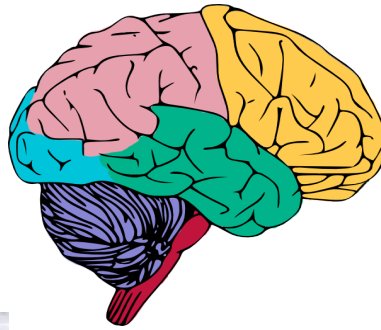
Under Construction & Under the Influence



THE HONEY BEE
FOUNDATION

Melissa Tassé, Ph.D.

website: THBF.org
email: mtasse@thbf.org



Addiction At-Risk Period

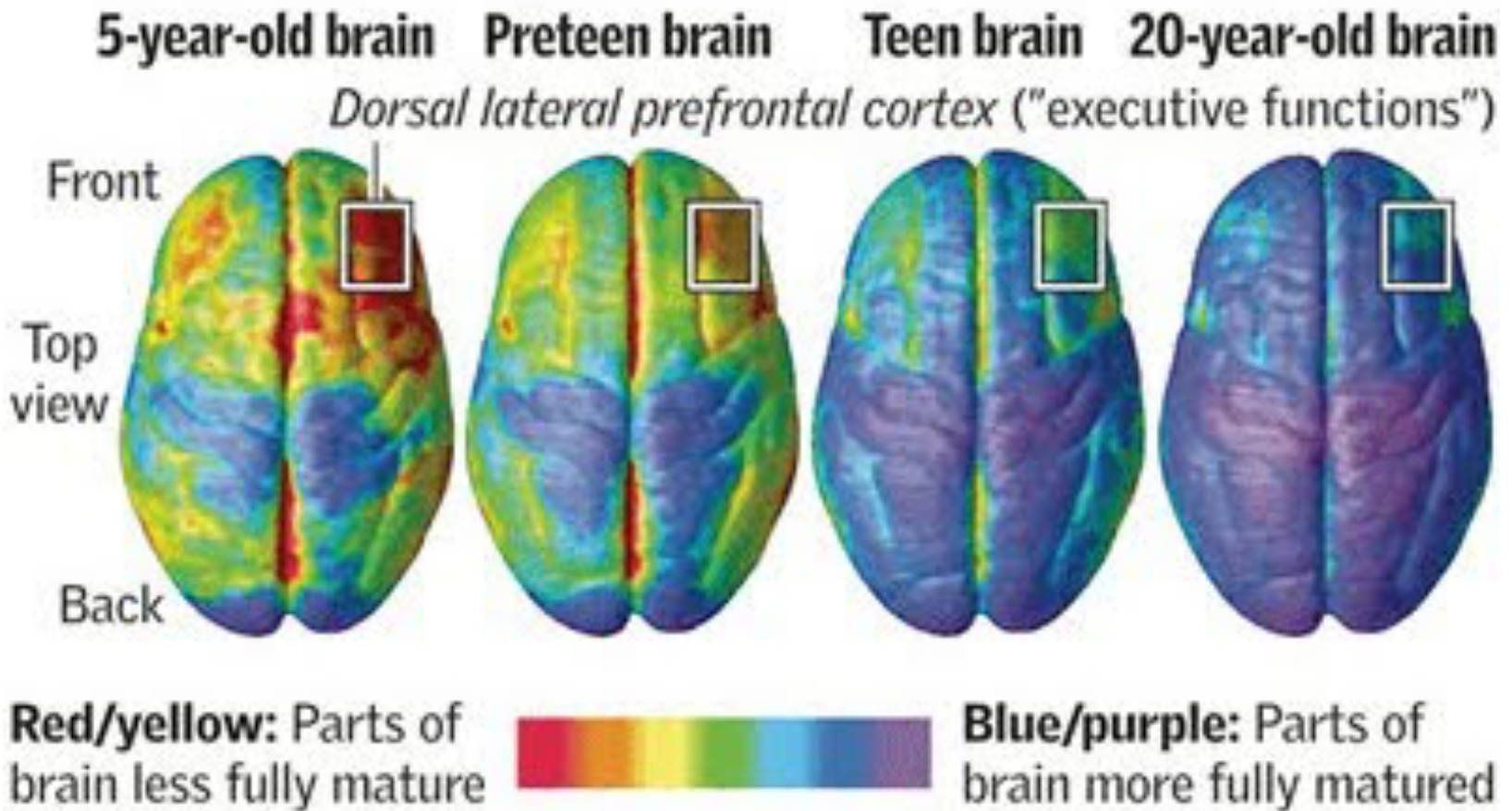
ADOLESCENCE

- **94% of all addictions initiate during adolescence**
- **Earlier Use = Greater Risk (<15 years 5X more likely)**
- **Why?**

Your Child and SUD *up until 25 +*



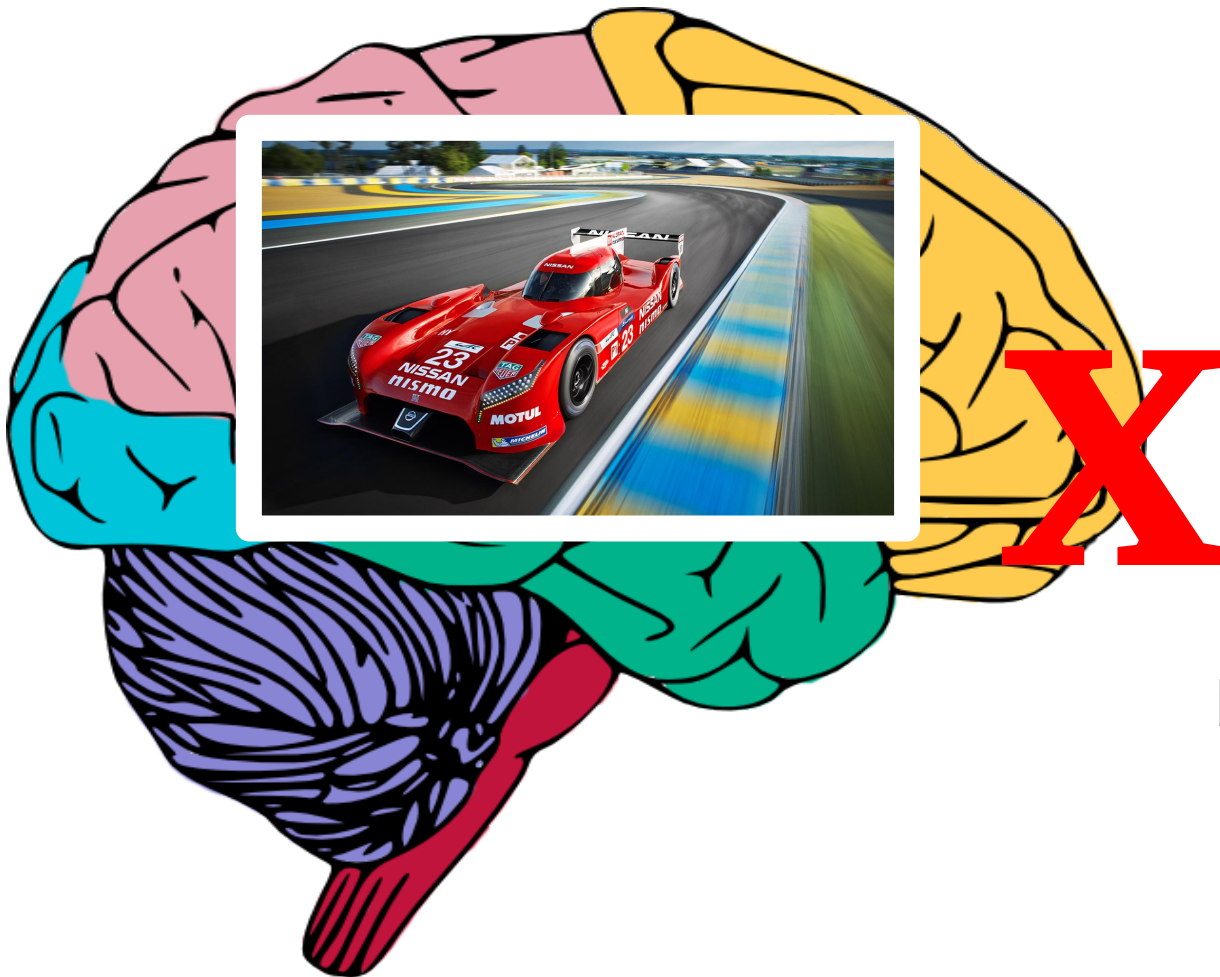
Brain Development



Sources: National Institute of Mental Health;
Paul Thompson, Ph.D., UCLA Laboratory of
Neuro Imaging

Thomas McKay | The Denver Post

Adolescent Brain (until age 25)



Judgment

Right v. Wrong

Impuls Control

Decision Making

~~X~~

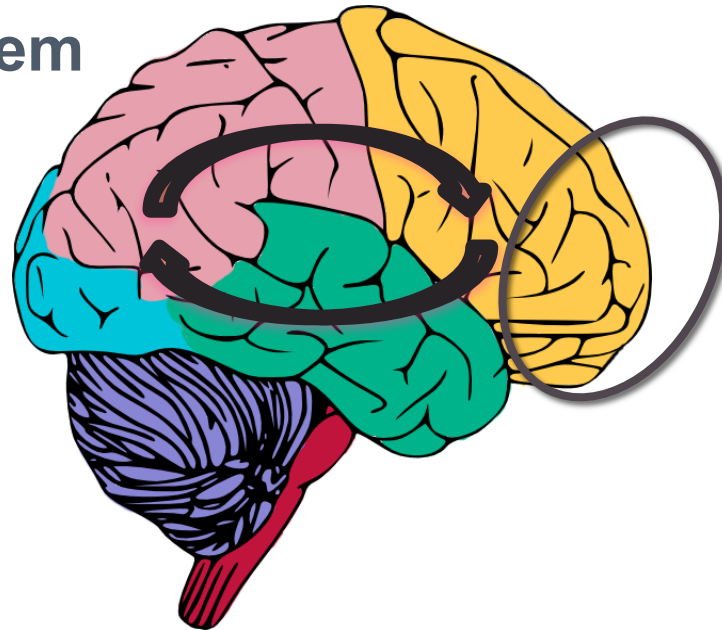
~~X~~

Your Child's Brain *up* *until 25 +*



Teen Brain : Same areas vulnerable to substances and recruitment by traffickers

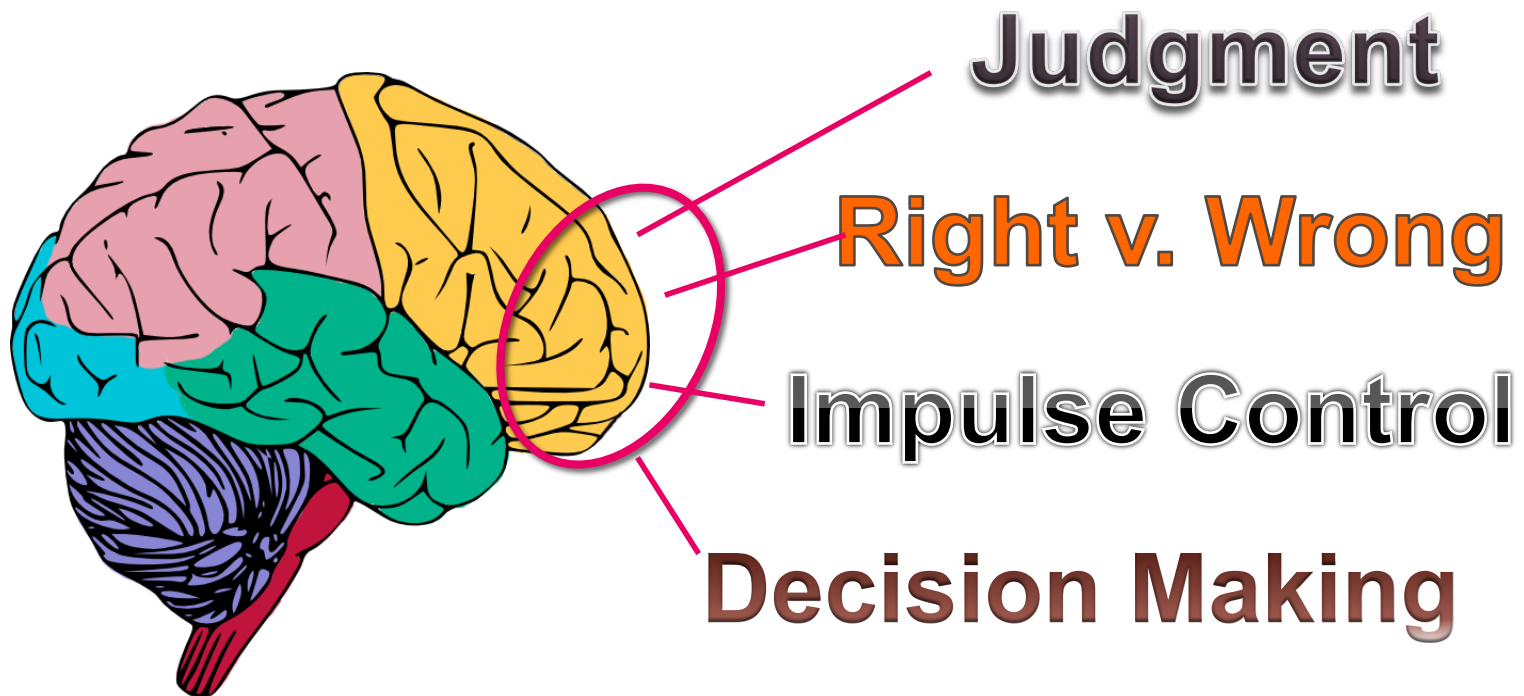
Limbic System



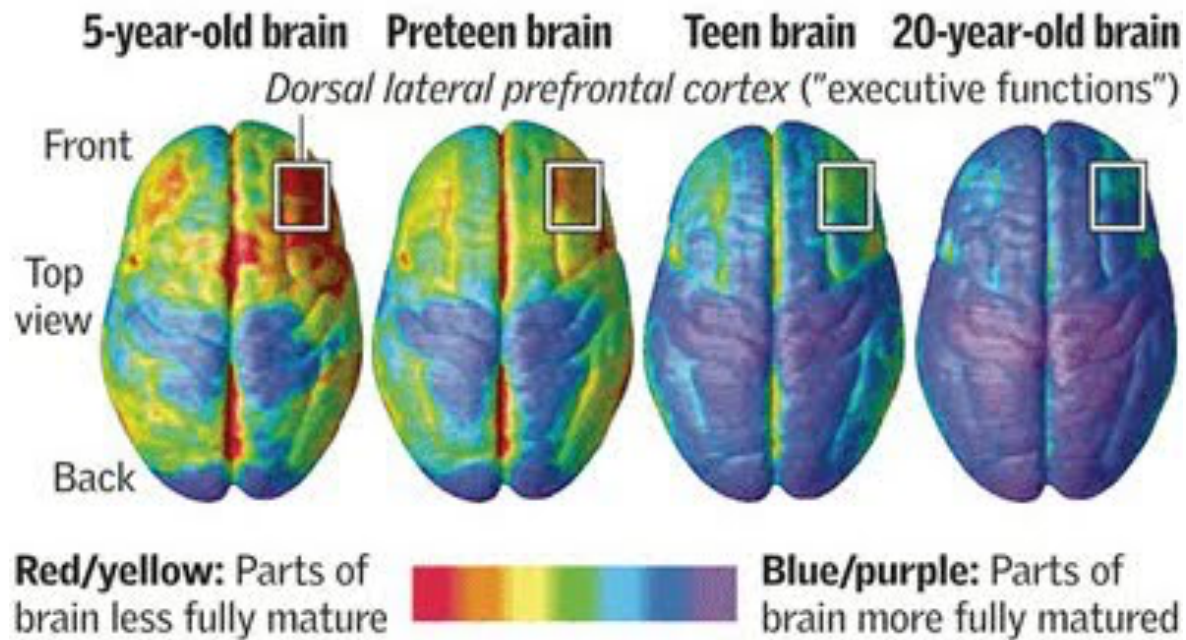
Prefrontal Cortex

Mature Brain (after 25)

Prefrontal Cortex



Brain Development

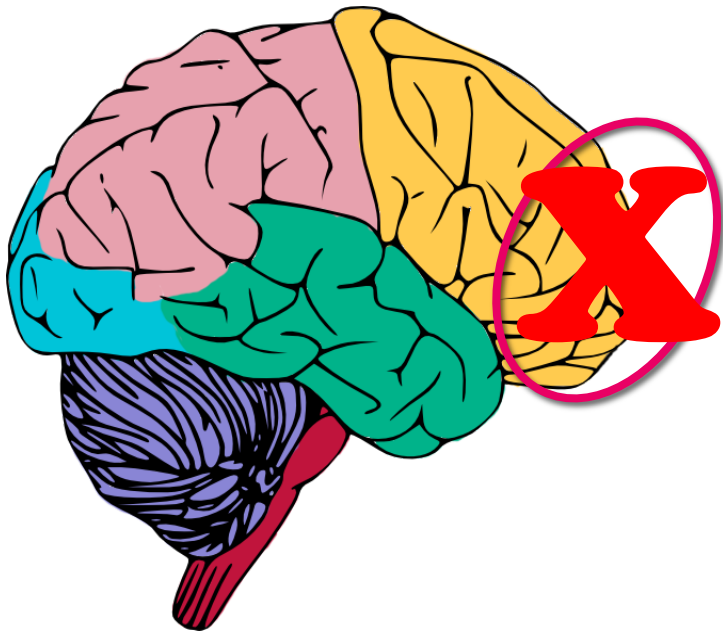


Sources: National Institute of Mental Health;
Paul Thompson, Ph.D., UCLA Laboratory of
Neuro Imaging

Thomas McKay | The Denver Post

Teen Brain & Substance Use Disorder

Prefrontal Cortex



Judgment

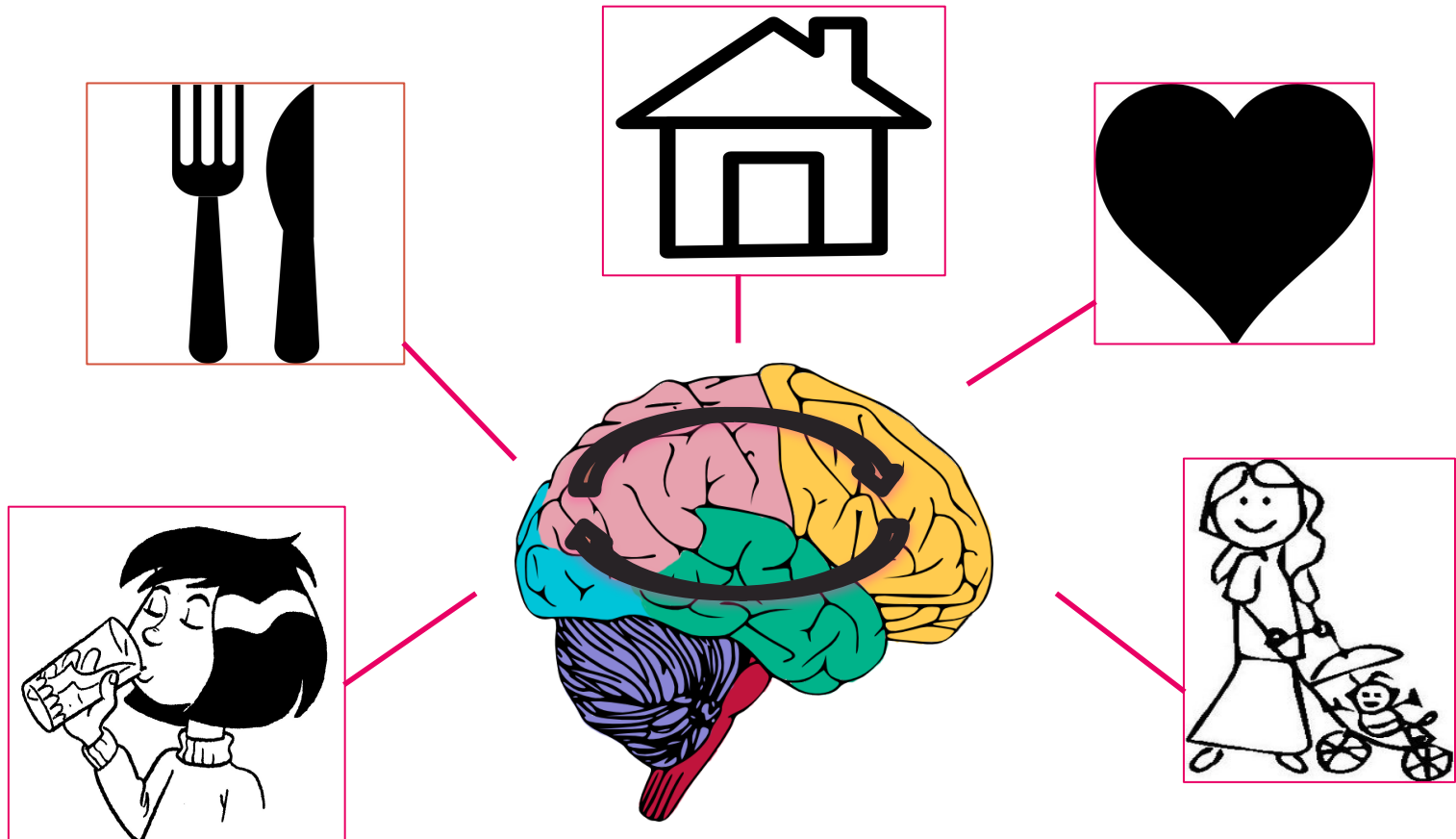
Right or Wrong

Impulse Control

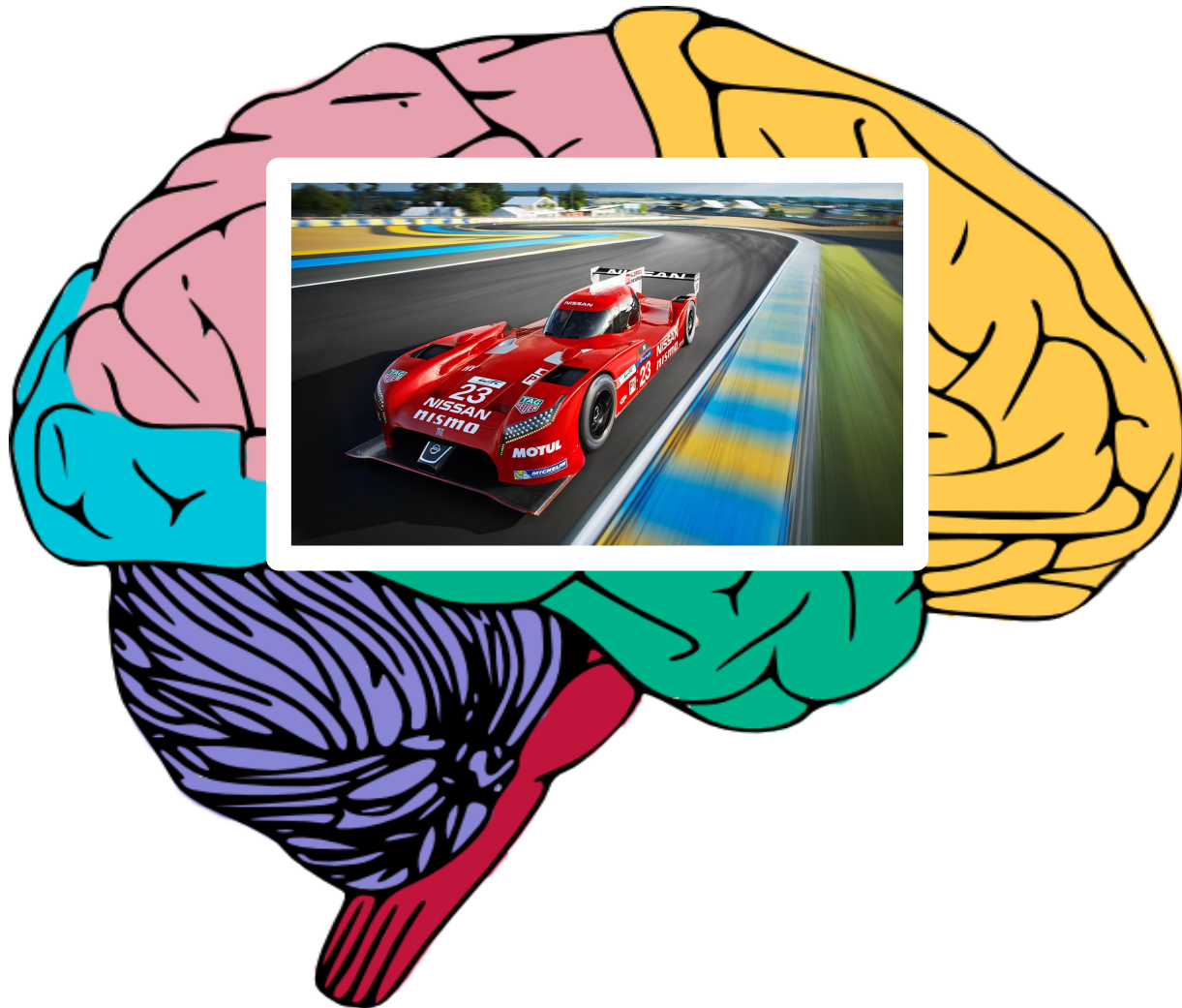
Decision Making



Typical Brain Limbic System

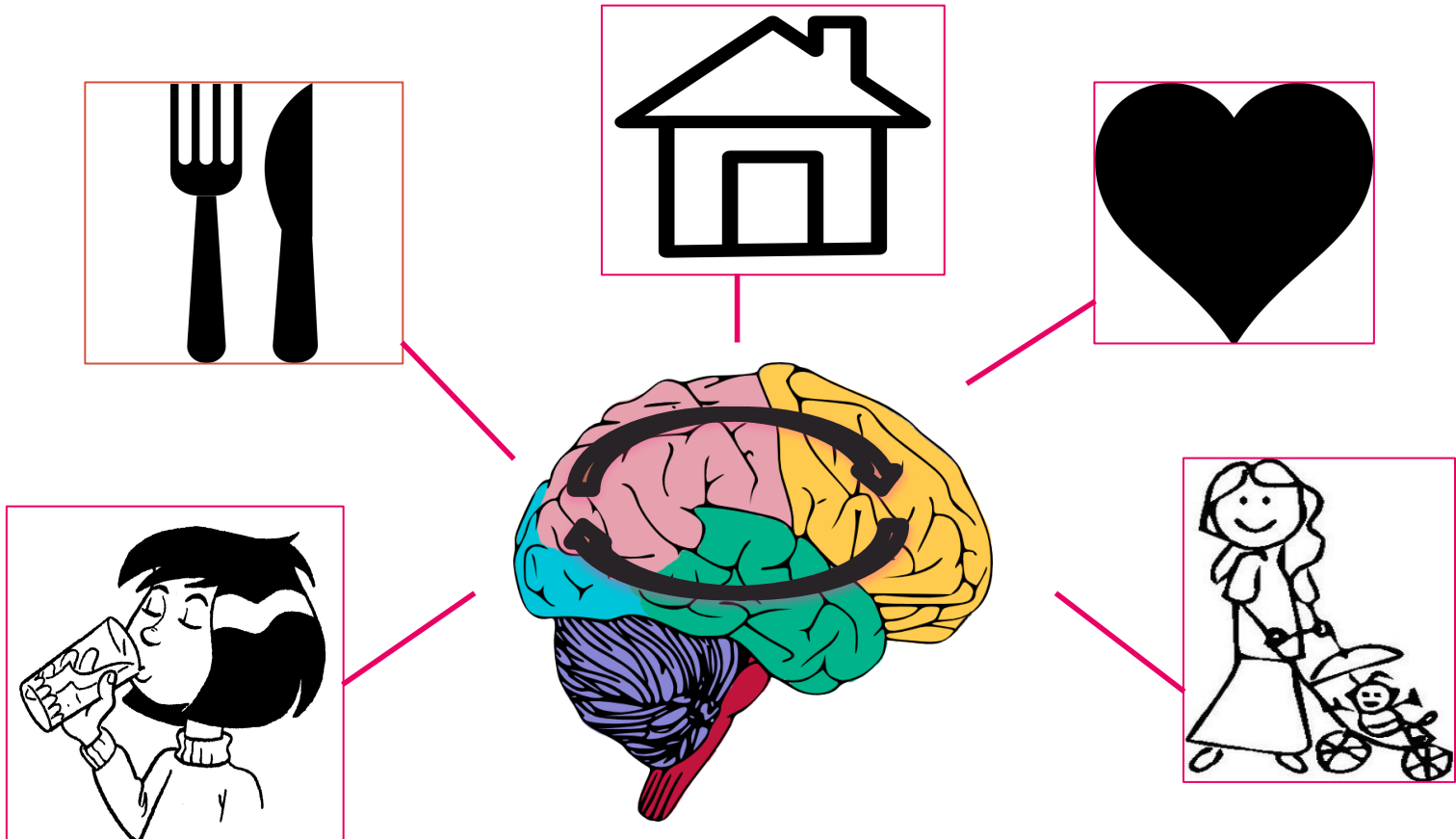


Adolescence: Learning and Seeking Reward



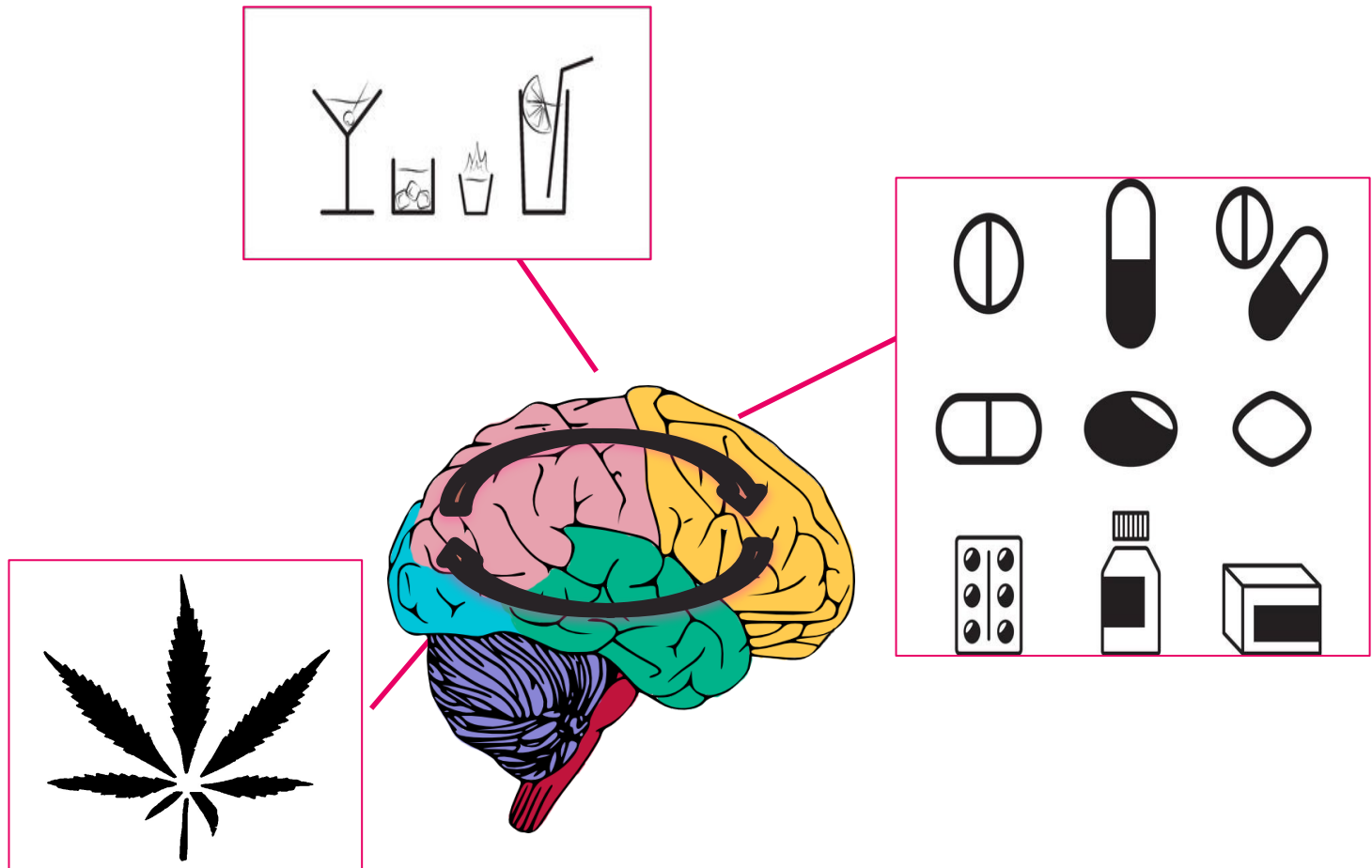
- primitive brain: efficiently seeking reward for survival
 - eating
 - drinking
 - sleeping
 - relationships
 - sex
- **learning** that these behaviors are good
- brain **learns** that nicotine and/or other substances make you feel good
- nicotine &/or other substances cause **long-term changes** to brain

With Substance Use Disorder.... Instead of this

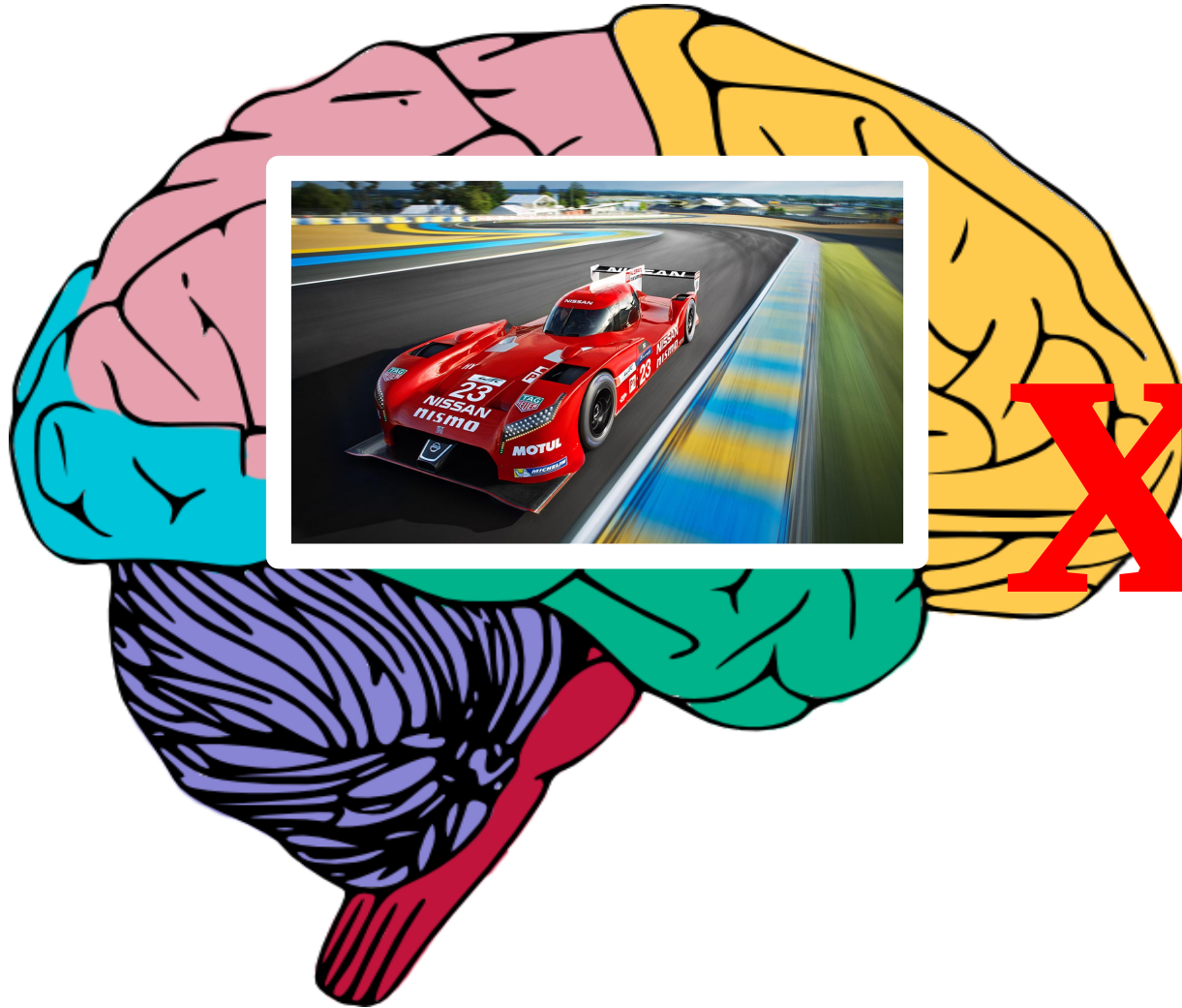


Substance Use Disorder

limbic system



Adolescence: Double Jeopardy



Judgment

Right v. Wrong

Impuls Control

Decision Making

X

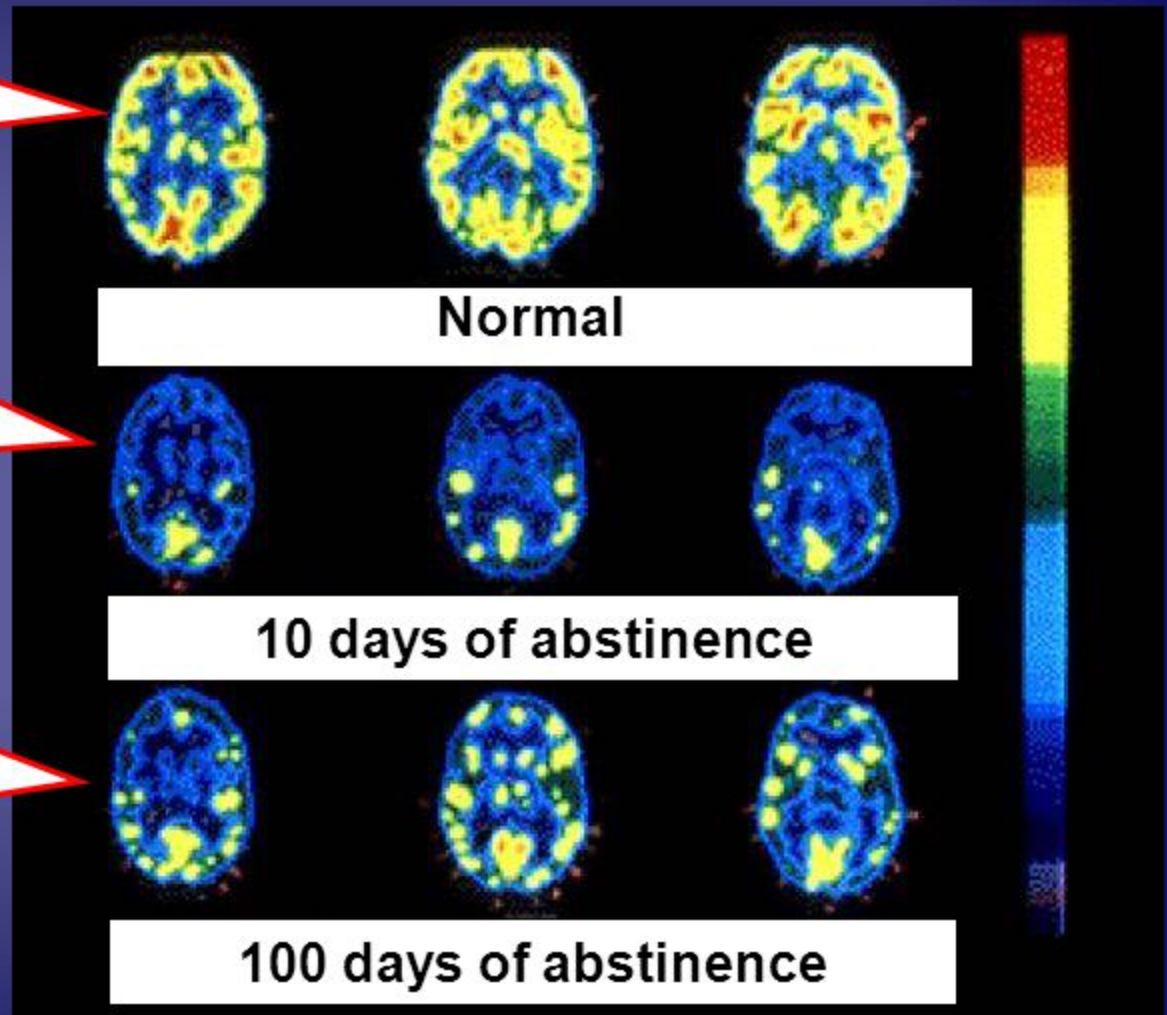
X

Healing Takes Time

Normal levels of brain activity in PET scans show up in yellow to red

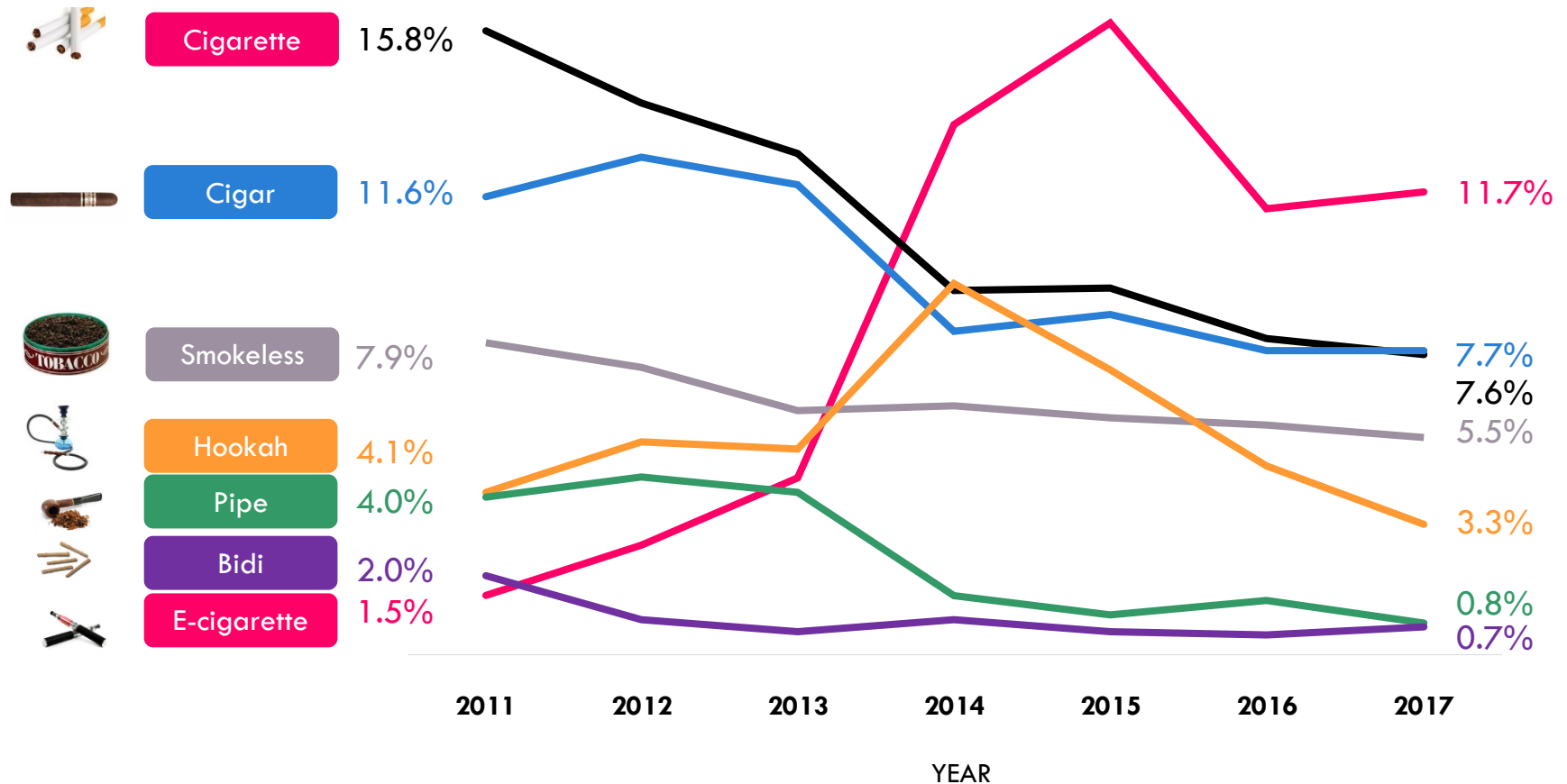
Reduced brain activity after regular use can be seen even after 10 days of abstinence

After 100 days of abstinence, we can see brain activity “starting” to recover



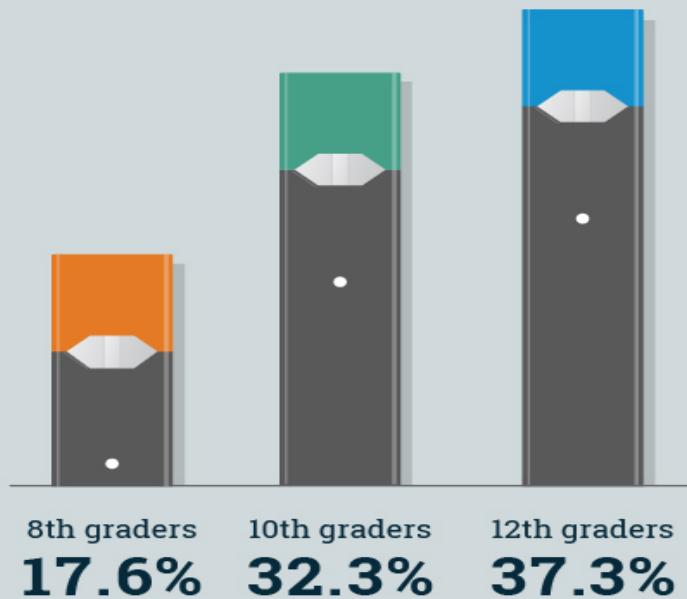
Source: Volkow ND, Hitzemann R, Wang C-I, Fowler JS, Wolf AP, Dewey SL. Long-term frontal brain metabolic changes in cocaine abusers. *Synapse* 11:184-190, 1992; Volkow ND, Fowler JS, Wang G-J, Hitzemann R, Logan J, Schlyer D, Dewey S, Wolf AP. Decreased dopamine D2 receptor availability is associated with reduced frontal metabolism in cocaine abusers. *Synapse* 14:169-177, 1993.

Current Tobacco Product Use Among U.S. High School Students by Tobacco Product – NYTS 2011-2017

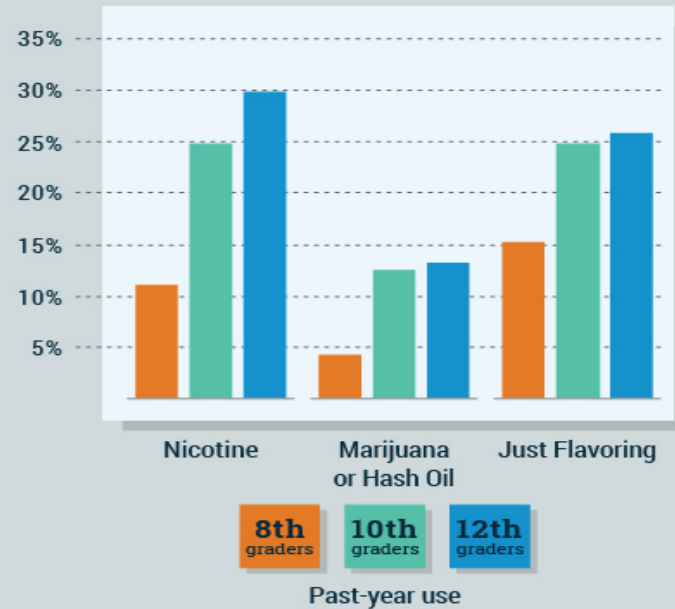


TEENS USING VAPING DEVICES IN RECORD NUMBERS

PAST-YEAR VAPING



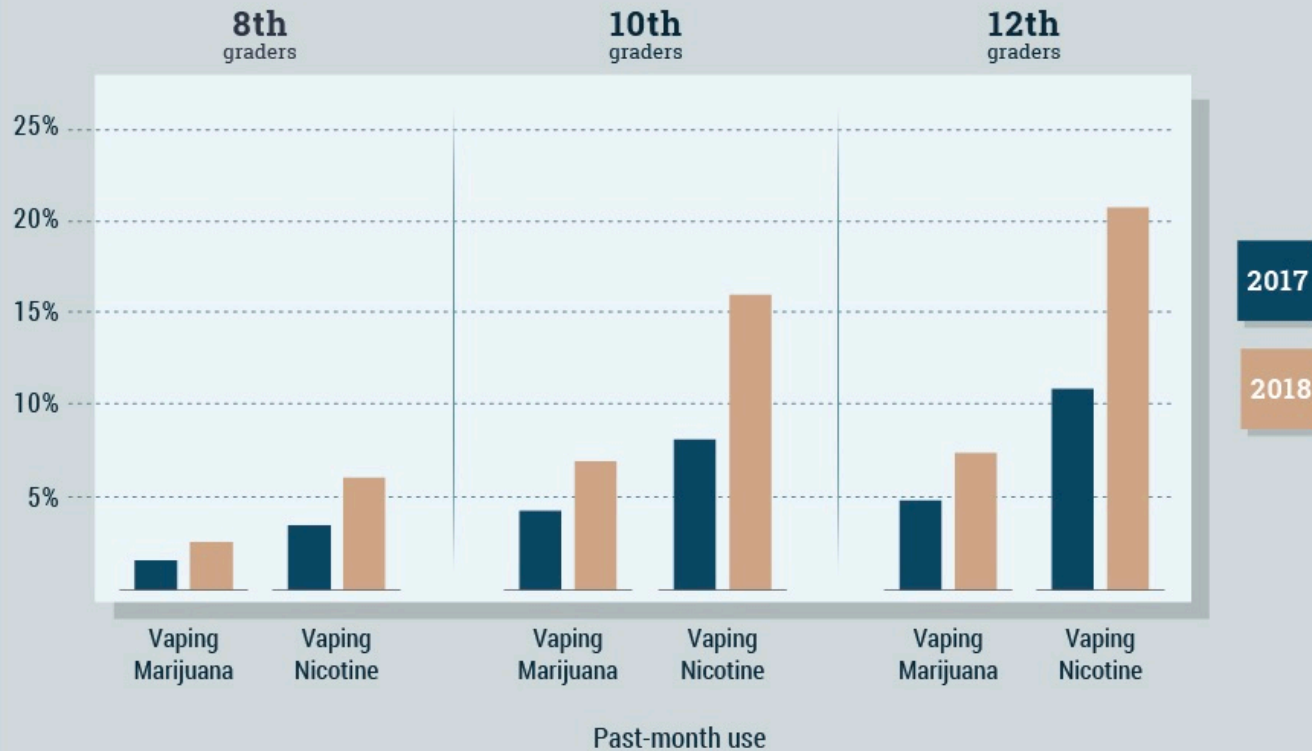
WHAT DO TEENS SAY THEY ARE VAPING?



NEARLY 2 IN 5 STUDENTS IN 12TH GRADE REPORT PAST-YEAR VAPING, RAISING CONCERNS ABOUT THE IMPACT ON BRAIN HEALTH AND POTENTIAL FOR ADDICTION.



TEENS VAPING NICOTINE OR MARIJUANA INCREASED ACROSS ALL GRADES



PAST-MONTH VAPING OF NICOTINE OR MARIJUANA JUMPED ACROSS ALL GRADES. PAST-MONTH USE OF MARIJUANA IS STEADY AS CIGARETTE USE DECLINES.



Components of ALL e-cigs, Juuls, vapes



Many Types of Devices

1st Generation
“Cigalike”



2nd Generation
Vape Pen



3rd Generation
Vape Mods



Juul – most popular by far



1 Juul cartridge = 20 cigarettes

What do they look like?



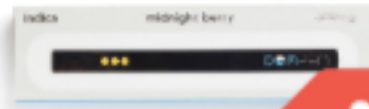
What is Being Vaped?

- Flavored liquids including chemicals like glycerin and polyethylene glycol



- Flavored liquids with varying levels of nicotine
- Leaf marijuana/ THC oil

Vaping Marijuana & Oils; Disposable MJ Vape Pens/cartridges



\$40
Midnight Berry
DomPen



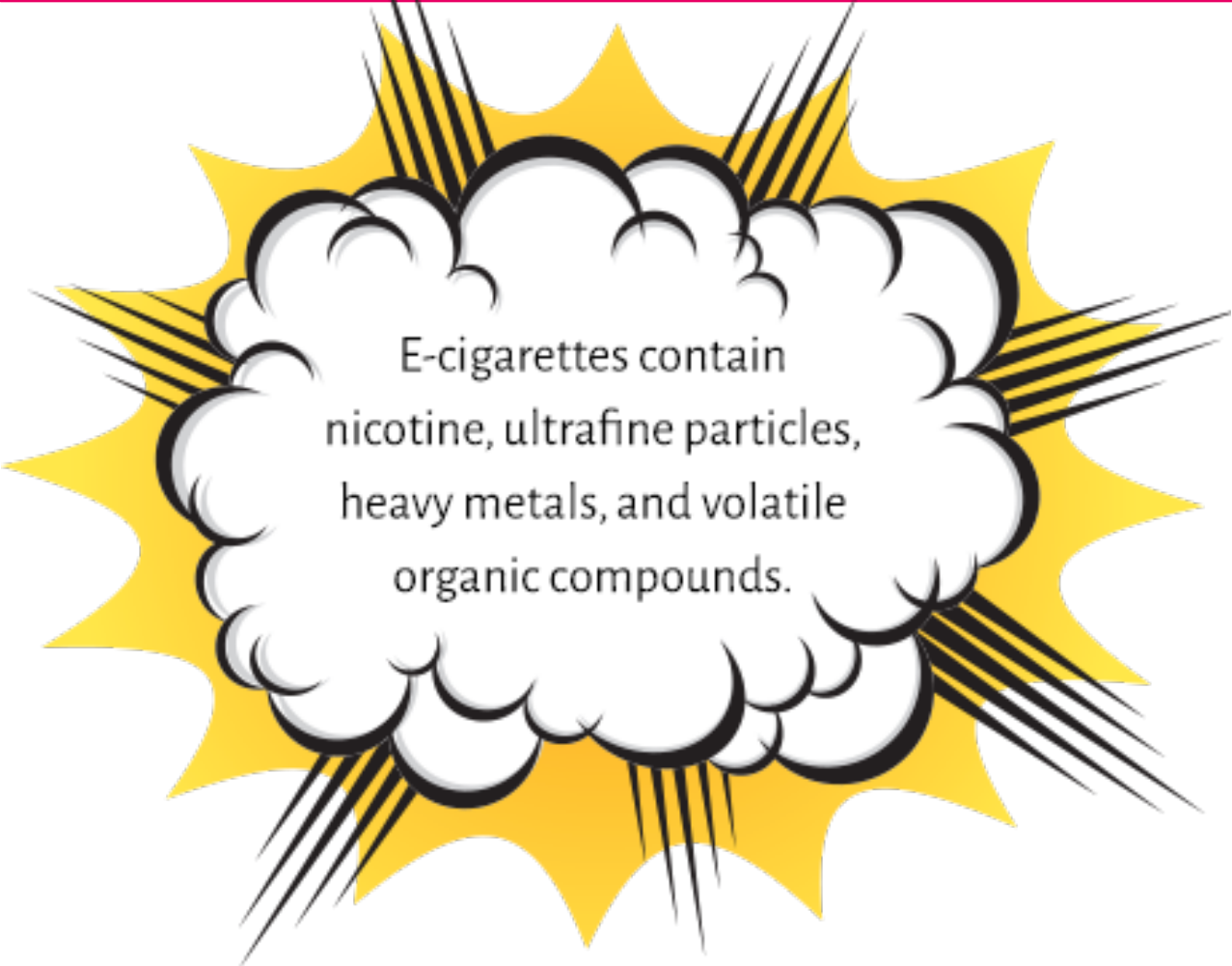
\$16
Purple Kush
Bloom Farms

Delivered to your door by EAZE

What's The Harm?



What's The Harm?



E-cigarettes contain nicotine, ultrafine particles, heavy metals, and volatile organic compounds.

Chemicals in e-cigarettes

Forty-Two Chemicals Identified in Electronic Cigarettes

2-butanone (MEK)
 2-furaldehyde
 Acetaldehyde ✓ *

Acetic acid
 Acetone ✓
 Acrolein ✓
 Aluminum
 Barium
 Benzene ✓ *

Boron
 Butanal

Butyl hydroxyl toluene
 Cadmium ✓ *

Chromium ✓ *

Copper

Crotonaldehyde

Diethylene Glycol ✓

Formaldehyde ✓ *

Glyoxal

Iron

Isoprene ✓

Lead ✓ *

✓ = exposure can
 be harmful to health

* Known Carcinogen

Red = emitted in
 second hand vapor

Limonene
 m,p-Xylen
 Magnesium
 Manganese
 Nickel ✓ *

Nicotine ✓

N-Nitrosornicotine ✓ *

o-Methylbenzaldehyde ✓

p,m-Xylene

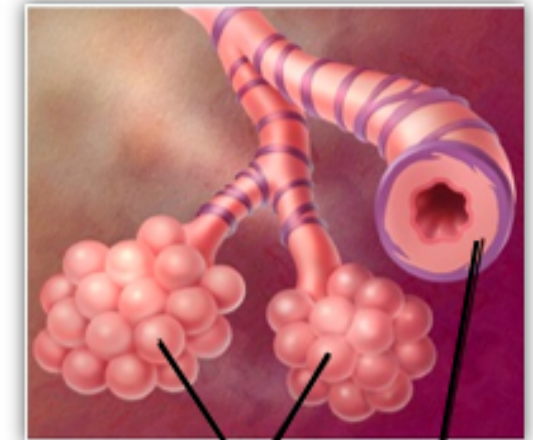
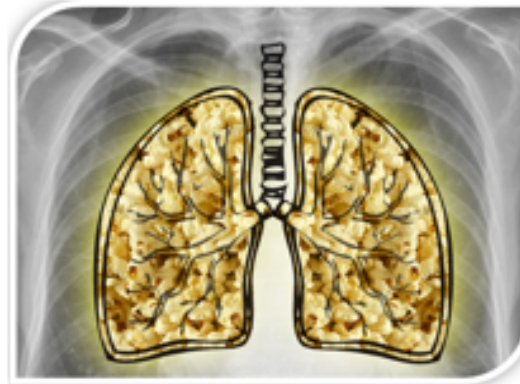
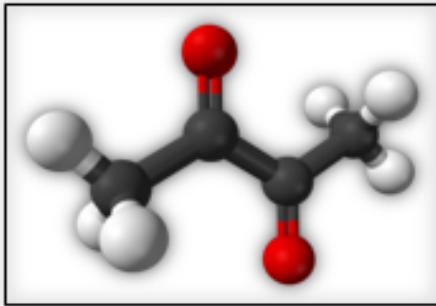
Phenol ✓

Polycyclic Aromatic Hydrocarbons ✓ *

Potassium
 Propanal ✓
 Propylene Glycol ✓
 Sulfur
 Tin ✓
 Toluene ✓
 Valeraldehyde
 Zinc
 Zirconium

Health Concerns: Popcorn Lung

Diacetyl



Alveoli & Bronchioles
Experience scarring

- Inhaled chemicals scar tissue in the lungs reducing capacity and efficiency
- Harvard 2015 Study found diacetyl in 39 of 51 flavors
- No known cases???

But: Progress to combustible cigarettes

Association Between Initial Use of e-Cigarettes and Subsequent Cigarette Smoking Among Adolescents and Young Adults: A systematic review and meta-analysis.

Every study (9) found that e-cigarette use significantly predicts future smoking initiation. Taking into account findings from all studies, adolescent e-cigarette use increases the odds of smoking initiation about fourfold.



4X



The Ultimate Risk: Development of Addiction



get the facts

know the risks

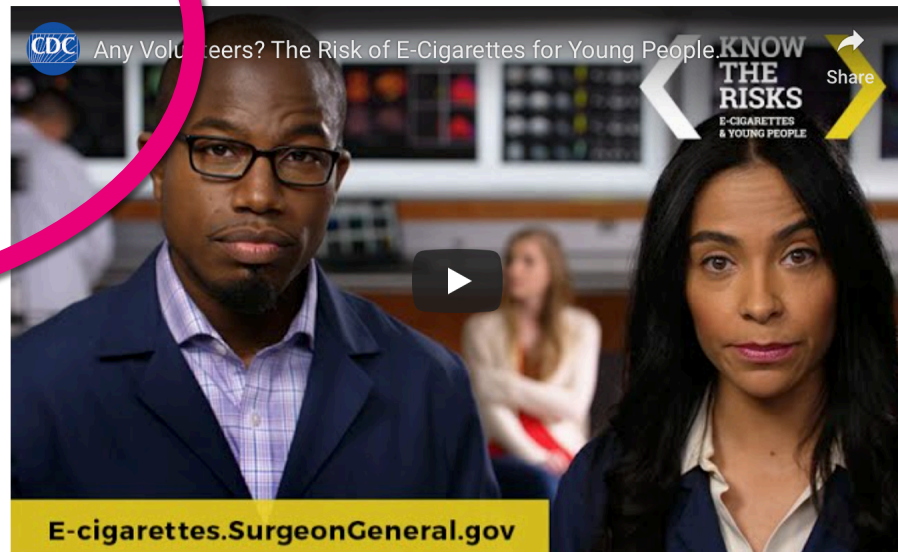
take action

about

resources

E-cigarettes and Brain Development

Nicotine exposure during adolescence, a critical period for brain development, can cause addiction and can harm the developing brain. This video underscores the health risks for teens.



If you are having difficulty playing the any of our YouTube videos please either use Internet Explorer to access the video or change your YouTube player from Flash to HTML5 and refresh your browser window. The Flash based YouTube player is currently not accessible to screen readers.

Nicotine during adolescence primes brain for future substance use

heroin,
meth, crack



cocaine



shrooms,
Ecstasy



Prescription/OTC medicine
(Rx/OTC)



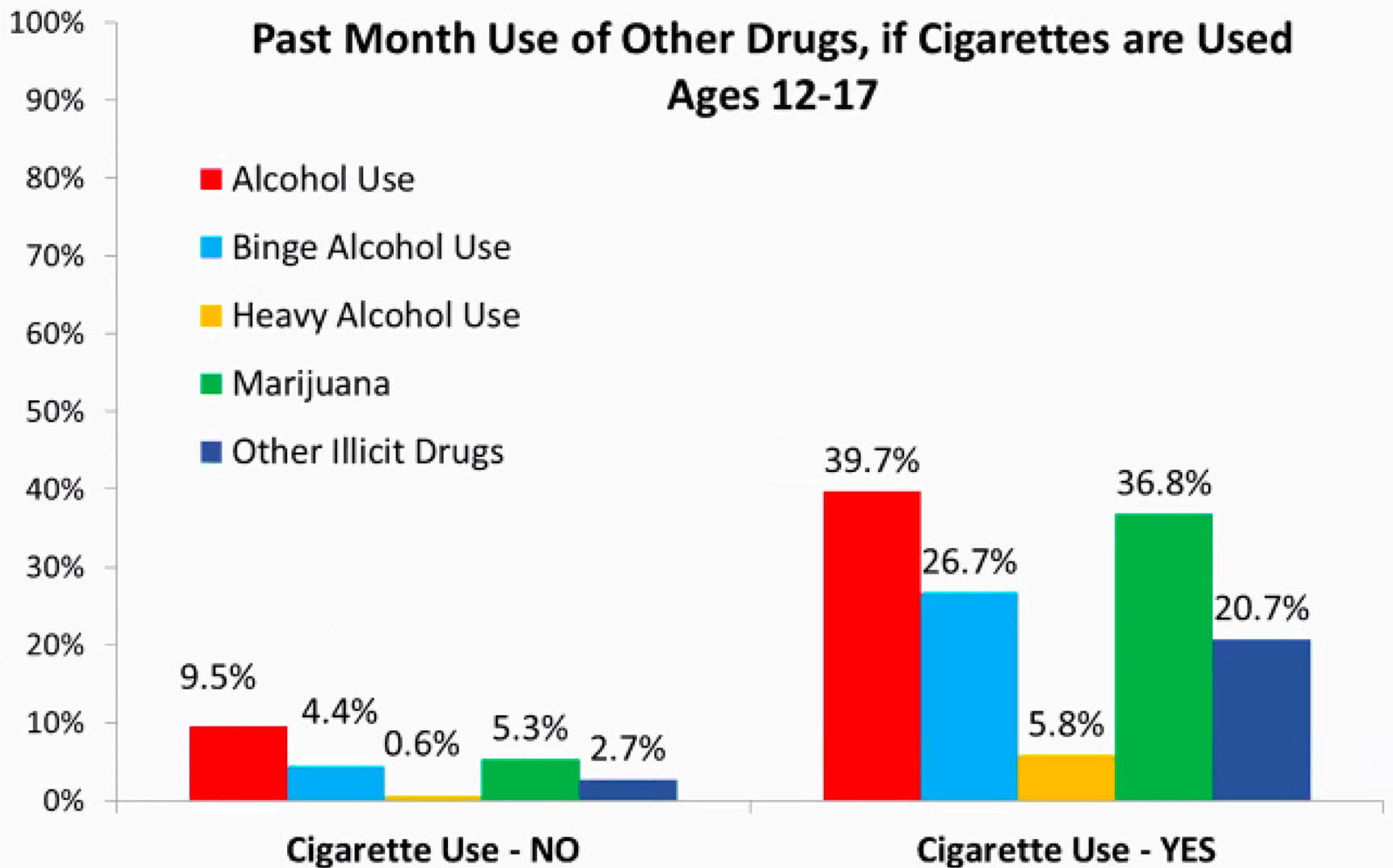
liquor,
marijuana



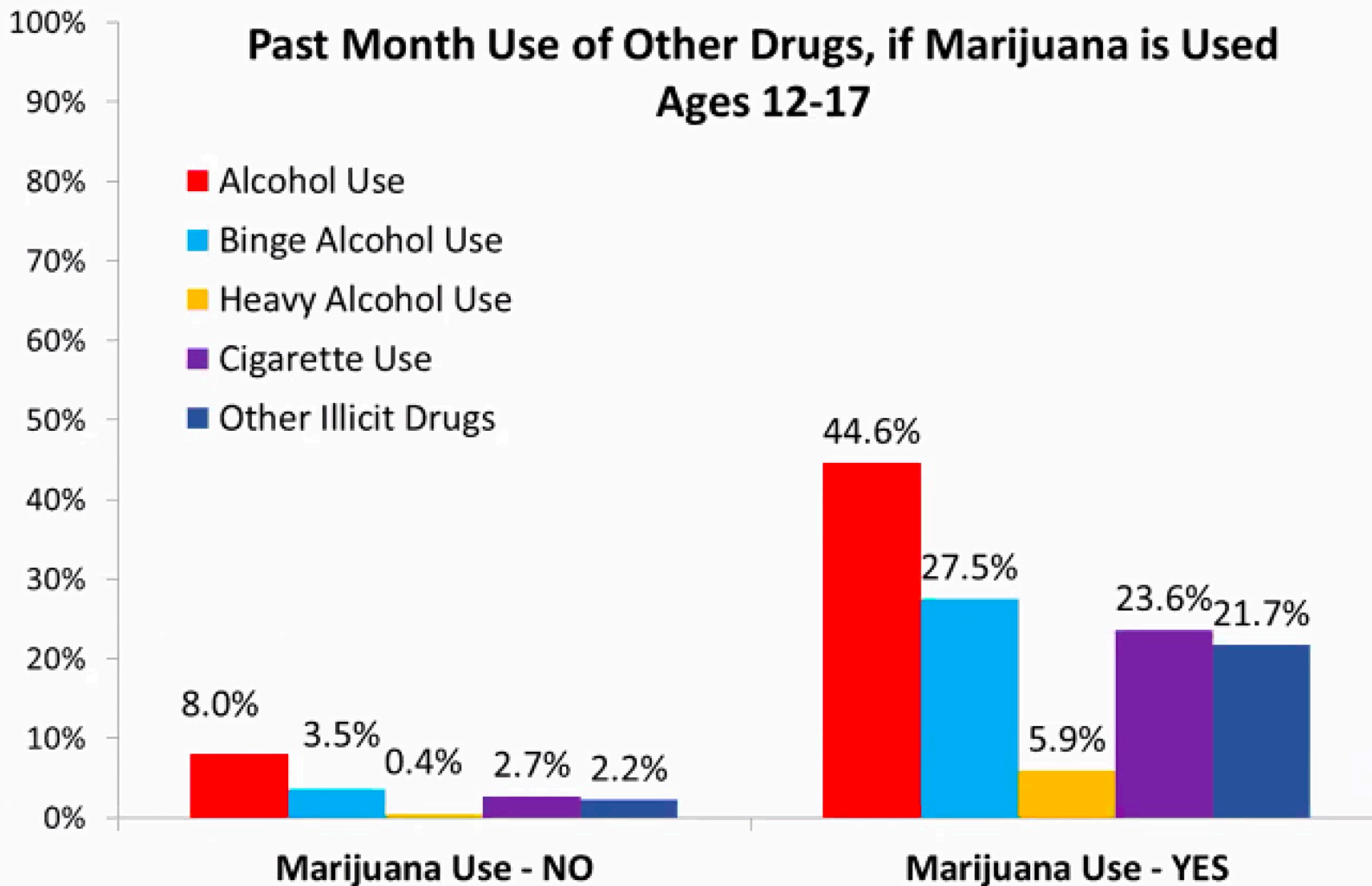
e-cigarettes,
cigarettes,
beer/wine



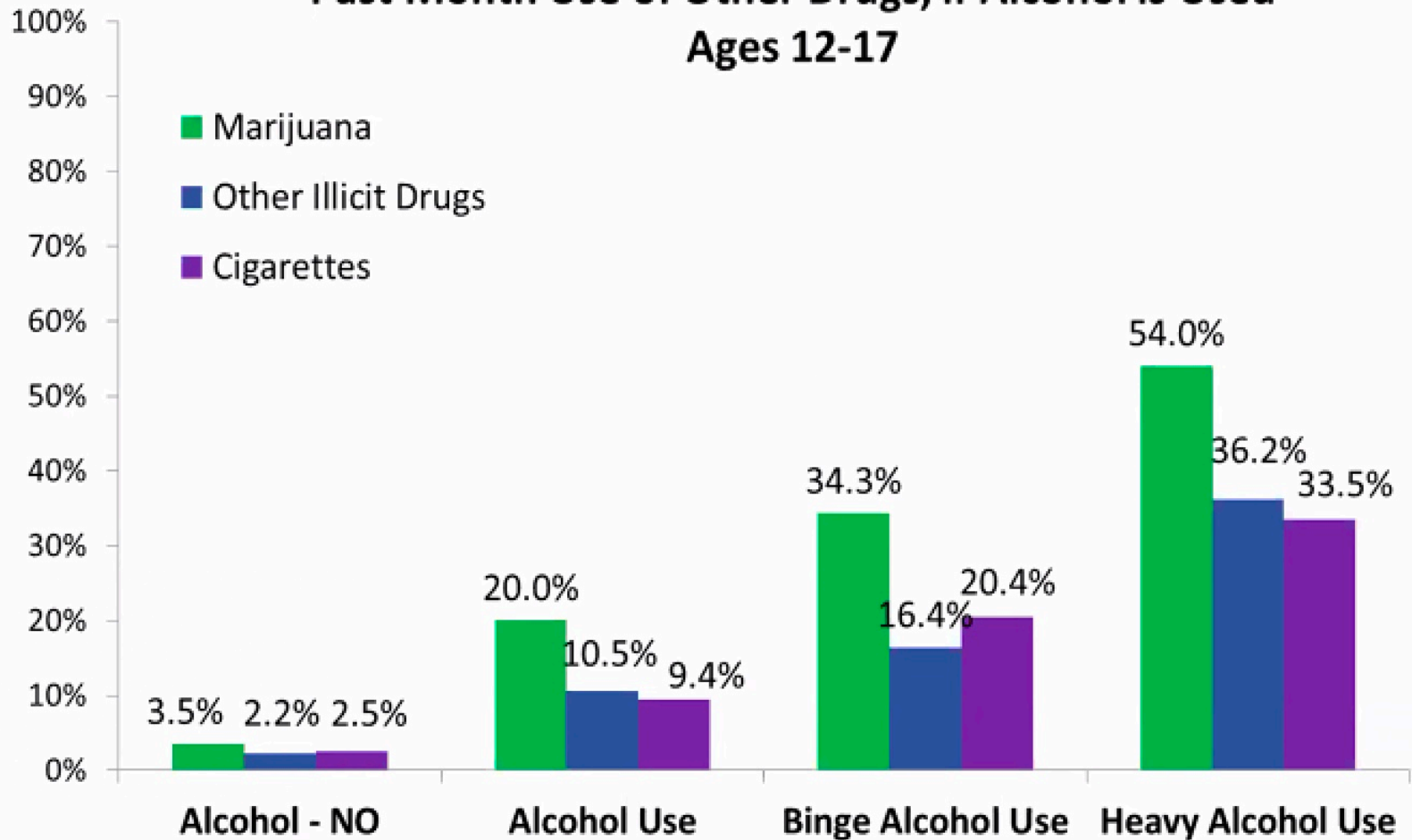
Past Month Use of Other Drugs, if Cigarettes are Used Ages 12-17



Past Month Use of Other Drugs, if Marijuana is Used Ages 12-17

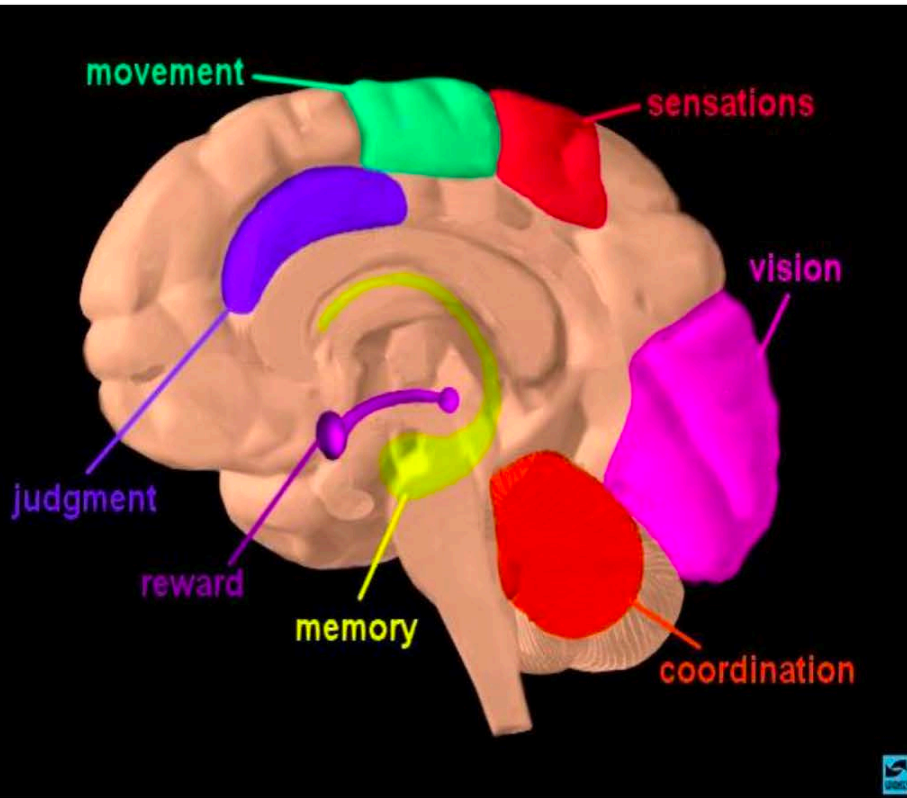


Past Month Use of Other Drugs, if Alcohol is Used Ages 12-17



Marijuana

Marijuana/CBD and the Brain



- Marijuana is a psycho-active substance – it is meant to affect your brain; “high” “wasted”
- Not surprisingly: CO and WA show a significant increase in road traffic accidents due to impaired driving because of marijuana



In adults, marijuana does affect the brain...

**But in children, adolescents, young adults:
marijuana affects the brain DEVELOPMENT**

- marijuana use has been shown to reduce IQ by an average of 8 points ⁽¹⁾
- regular marijuana users have lower grades, less likely to graduate from high school or college; lower satisfaction with life, earn lower income, greater unemployment ⁽²⁾
- One in six (!) will develop a life long substance abuse problem ⁽³⁾
- And we have no way to predict who – it could very well be your child*
- Vomiting, psychosis

1. Meier et al., 2012 Proc Nat Ac Sciences

2. 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

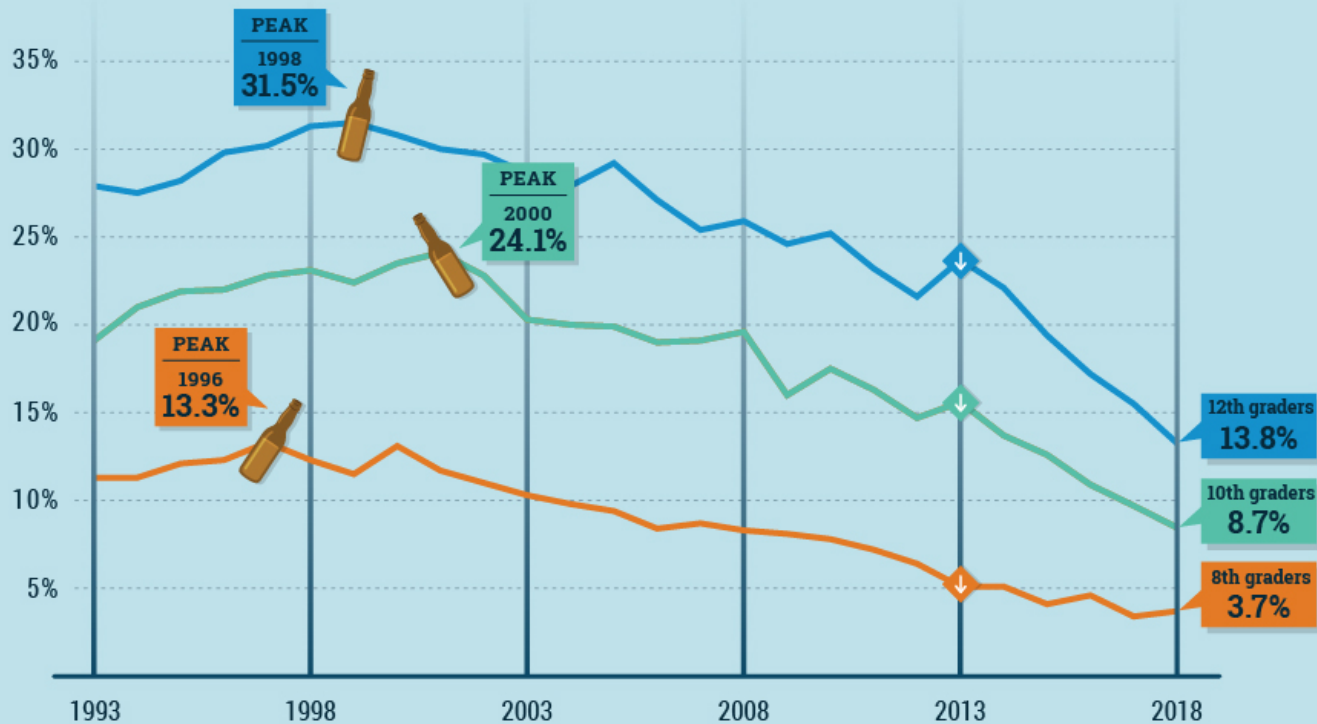
3. National Center on Addiction and Substance Abuse Report, 2011

Who is this made for?



Alcohol

BINGE DRINKING* RATES CONTINUE DOWNWARD TREND

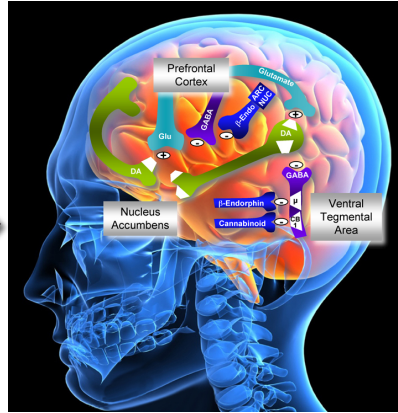
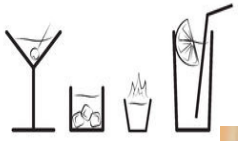


*Binge drinking is defined as having 5 or more drinks in a row in the last 2 weeks.

BINGE DRINKING: SIGNIFICANT DROP IN PAST FIVE YEARS ACROSS ALL GRADES.

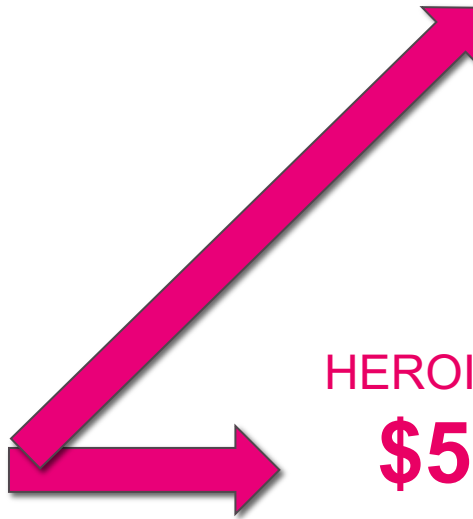


The Big Picture



CHRONIC changes

prescription painkiller
\$20-\$80
per pill X 5+ per day)



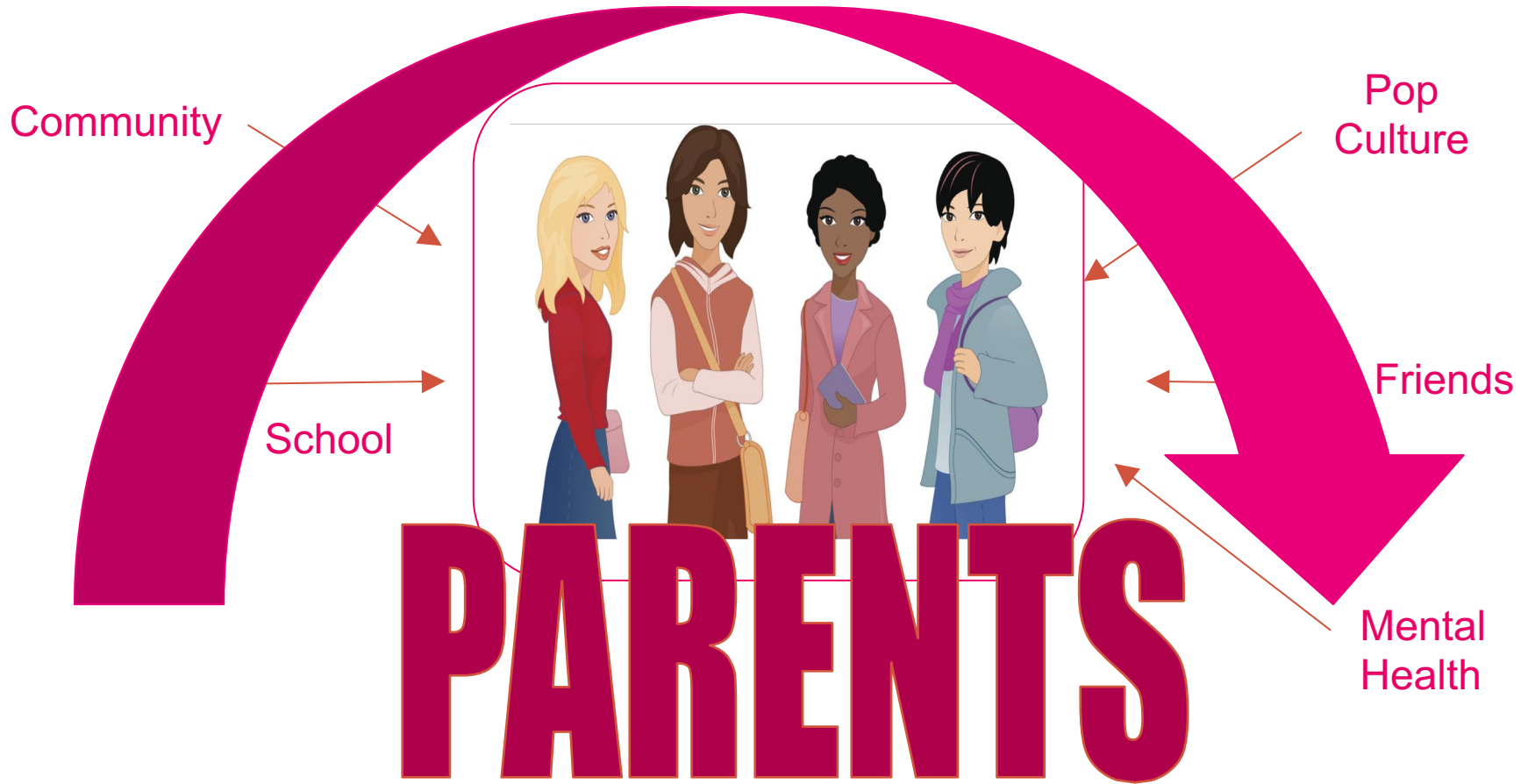
HEROIN
\$5



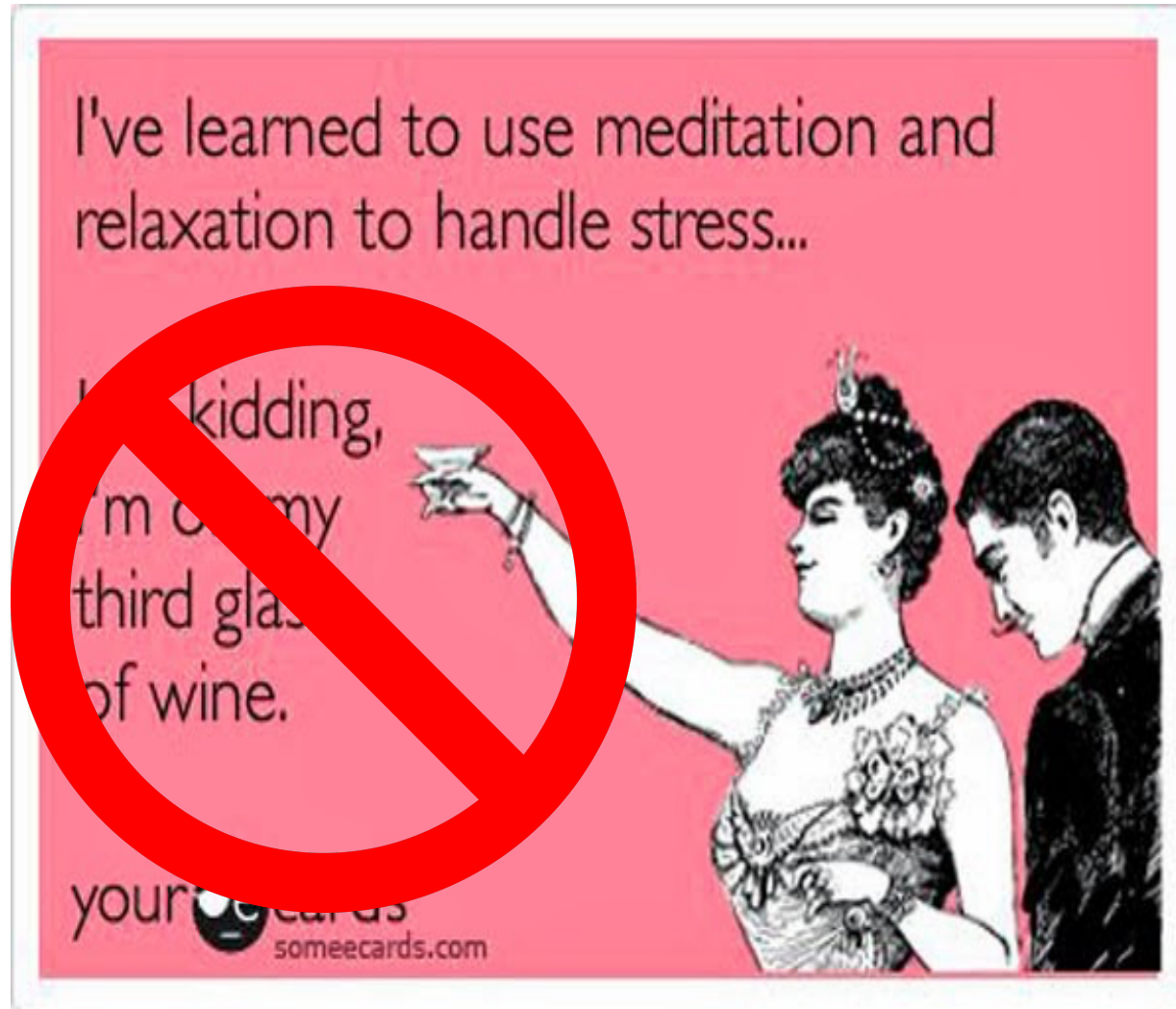
lying, working extra jobs,
stealing,
"Mom, can I have 20 bucks?"



You Are Important!



Modeling Behavior



Frequent Conversations

What do you think of Selena Gomez's drug use?

What is that funny smell?

How is a good way to "say no" without saying no?

What are healthy ways to deal with stress?

Let's figure out a code that you can use to let me know you are in an uncomfortable situation.

What would you do if your best friend tried an e-cigarette?