The background of the slide features a detailed, dark-toned illustration of a human hand cupping a brain. The brain is rendered with intricate line work, showing its complex folds and structures. Overlaid on the image are several text elements: at the top, the word 'DECONSTRUCTED' in a large, cracked, blocky font; in the center, the main title 'The Addictoholic Deconstructed: Neurobiology of addiction 101' in white and yellow sans-serif fonts; and on the right side, a diagonal list of terms including 'crack', 'cocaine', 'dependency', 'sugar', 'methamphetamine', 'behavior', 'opioids', and 'cocaine'. In the bottom left corner, there is a small logo with the text 'PSYCHOLOGY BEHAVIOR ENSLAVED DRUGS'. In the bottom right corner, there is another small logo with the text 'DRUG ABUSE' and 'SADOMASOCHISM' below it.

The Addictoholic Deconstructed: Neurobiology of addiction 101

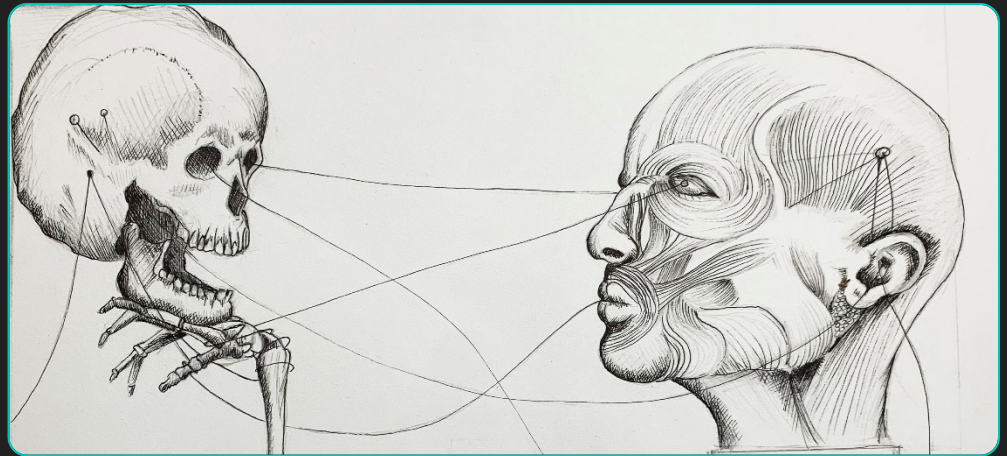
Nicole T. Labor, DO

Nicole T. Labor, DO, BCFP, BCABAM

- **Medical Director, OneEighty, Wooster, OH**
- Co-founder of Fellowship of Addiction Medicine, SummaHealth, Akron, OH
- Medical Director Esper Treatment Center, Erie, PA
- Medical Director, Interval Brotherhood Home, Akron, OH
- Associate Clinical Professor of psychiatry and family and community medicine, NEOMED
- Recovering Addictoholic
- Author
- All around badass

Why Talk About It

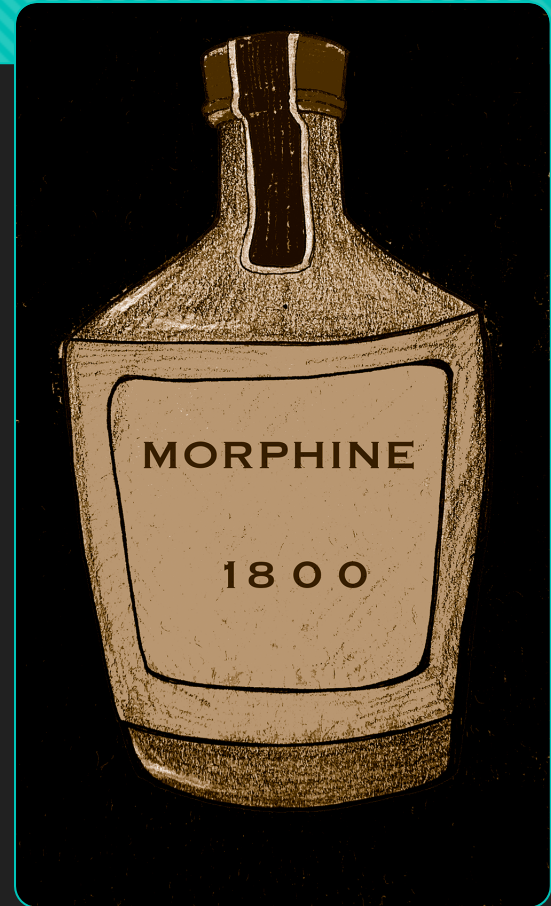
- As a society we do not treat addiction as a disease
 - Diabetes vs cancer vs addiction
- There is no such thing as an “opioid” epidemic but rather an “addiction” epidemic that simply changes the primary ‘symptom’ over time



**It Isn't a New
Phenomenon**


Prior “Opioid” Epidemics

1. Late 1800s: Morphine
 - Mainly middle class
 - Female > Male
2. Early 1900s: Heroin (pharmaceutical grade)
 - First generation Italians, Jews, Irish
 - Male > Female
3. 1950s-1970s- Heroin (illicit)
 - African American/Latinos
 - Male > Female



Other “epidemics”

Crack cocaine: In 1985, cocaine-related hospital emergencies rose by 12 percent, from 23,500 to 26,300. In 1986, these incidents increased 110 percent, from 26,300 to 55,200. Between 1984 and 1987, cocaine incidents increased to 94,000.



Methamphetamine: The **Combat Methamphetamine Epidemic Act of 2005 (CMEA)** is federal legislation enacted in the United States on March 9, 2006, to regulate, among other things, retail over-the-counter sales of following products because of their use in the manufacture of illegal drugs: ephedrine, pseudoephedrine, phenapropanolamine



Bath Salts: In October 2011, the DEA used its administrative powers to institute an emergency but temporary one-year ban on the three basic bath-salt chemicals, declaring them Schedule 1 substances. Possession can now lead to a four-year federal felony sentence.

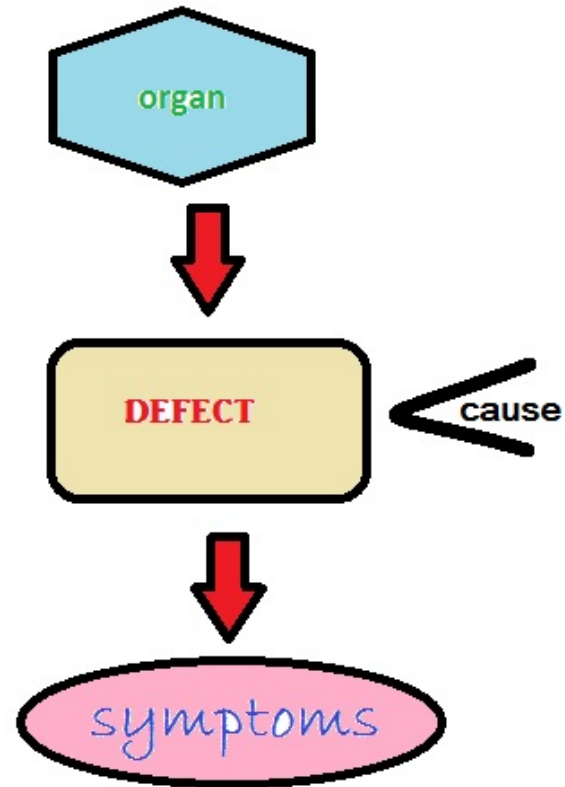


A Disease or Not a Disease

ADDICTION IS A DISEASE...

BUT HOW DO WE KNOW??

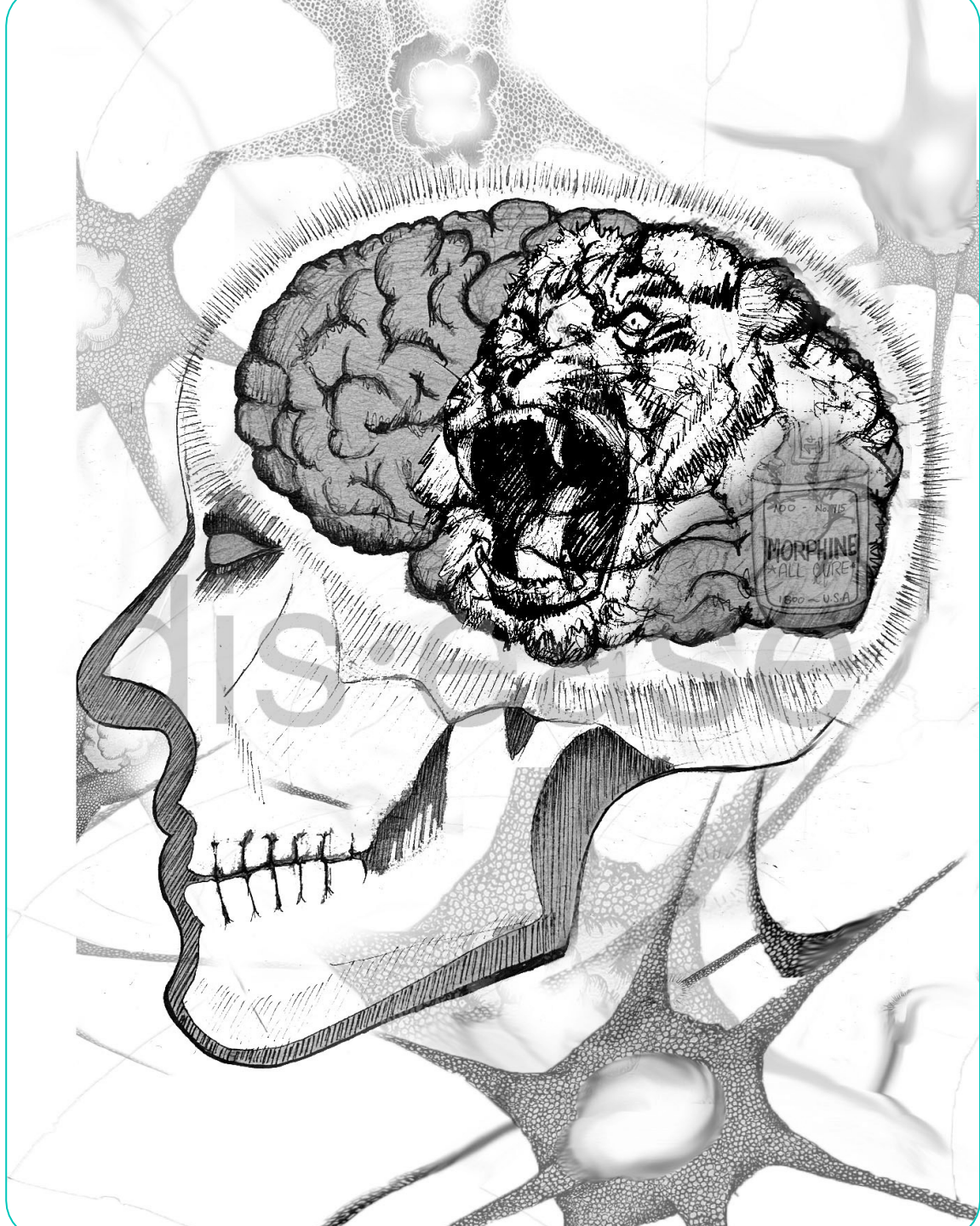
**THE
DISEASE
MODEL**



DEFINING DISEASE

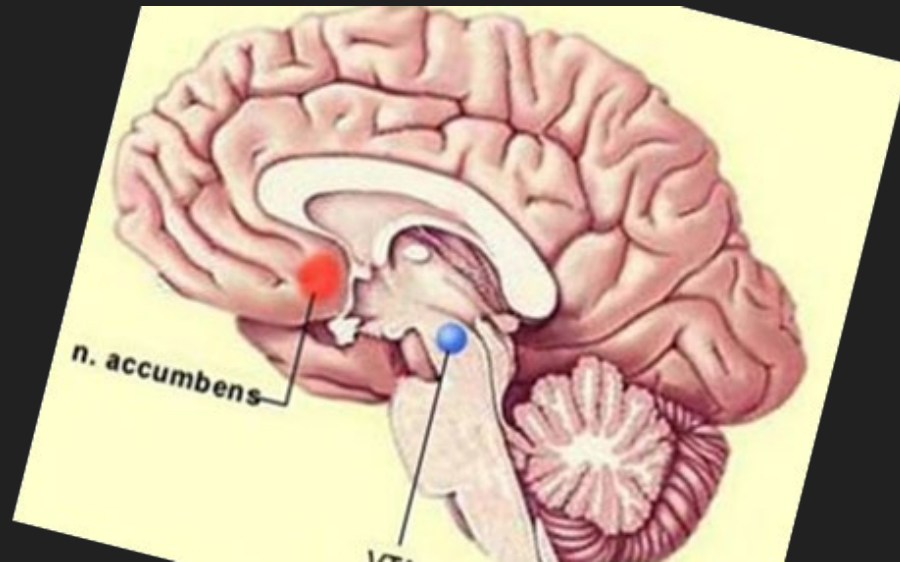
THE BRAIN... The GREATEST INSTRUMENT WE WILL NEVER FULLY UNDERSTAND

- The BRAIN is the organ involved in the disease of addiction
- Expensive (and honestly, not that great)
- So people with brain diseases start out at a disadvantage
- Everything we think, feel, do, say, imagine arises from direct and indirect electrical and chemical activity in the brain (if you are a reductionist)



THE MIDBRAIN: A.K.A The TIGER

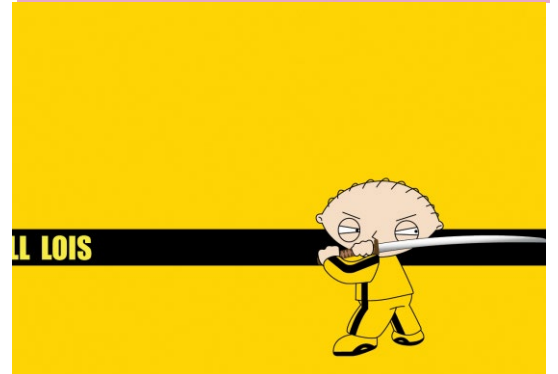
- Not conscious
- Acts immediately
- No goal planning
- No 'pros and cons'
- A life-or-death processing station



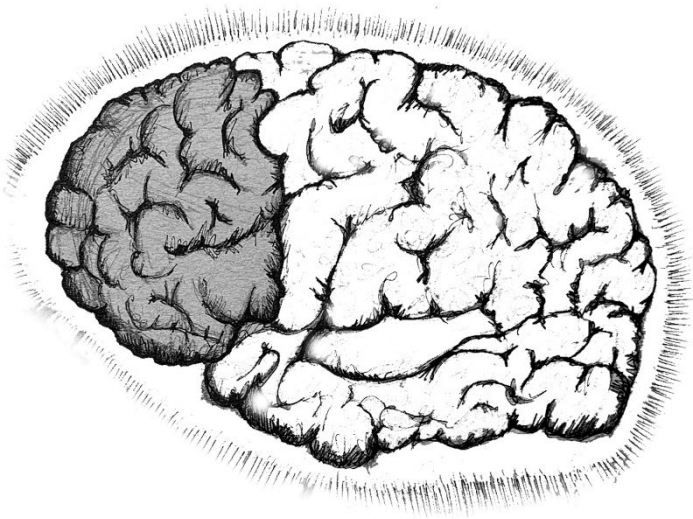
The Midbrain (aka Limbic Brain)
is the SURVIVAL brain. It handles:

- EAT!!
- KILL!!
- SEX!!!

I do NOT have permission to use these photos



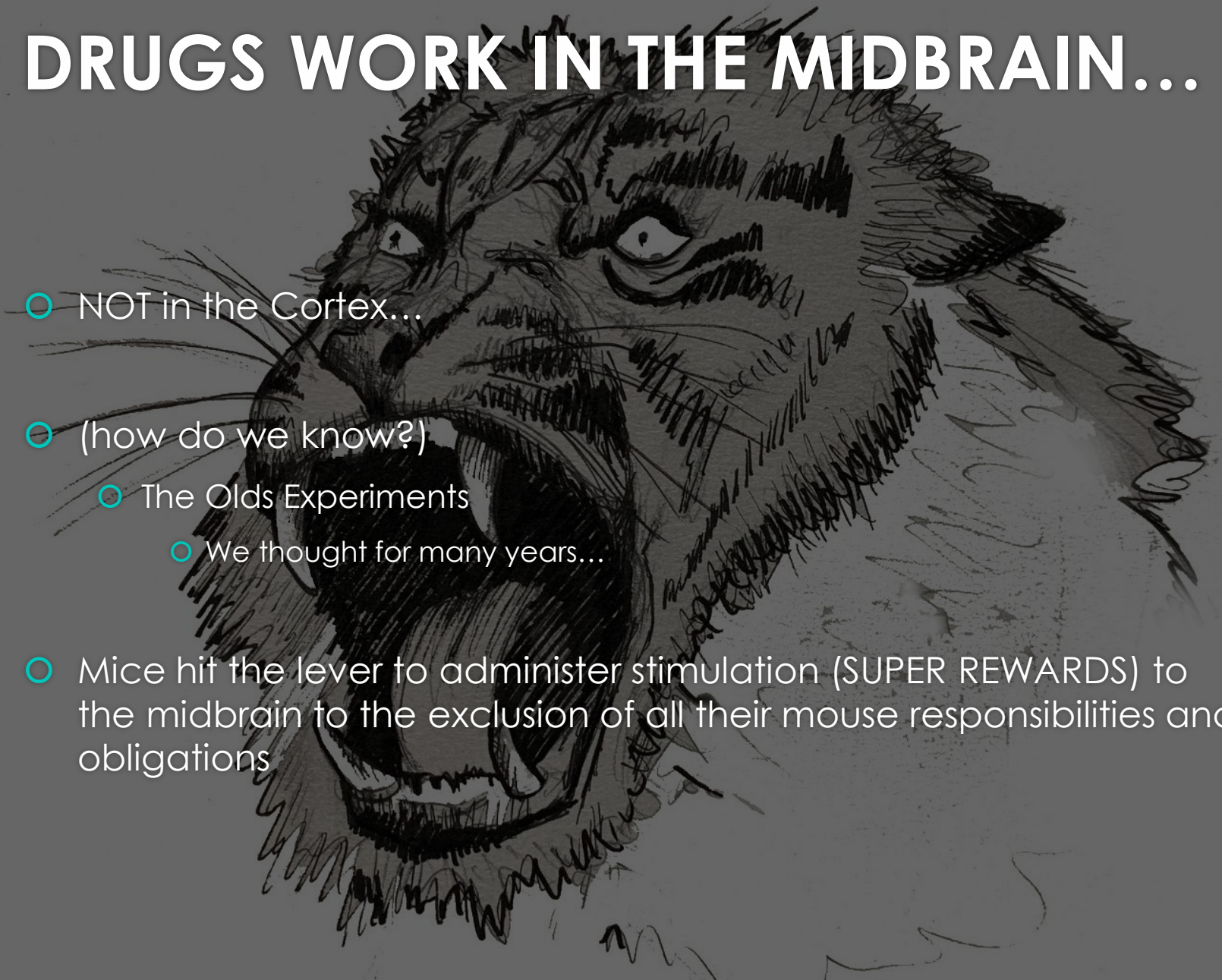
THE FRONTAL CORTEX: A.K.A The SUPERHERO



- It's what makes "You"
- Seat of the Self and Personality
- Love, Morality, Decency, Responsibility, Spirituality
- Conscious "choice" and 'willpower
- Where all your superpowers are located

DRUGS WORK IN THE MIDBRAIN...

- NOT in the Cortex...
- (how do we know?)
 - The Olds Experiments
 - We thought for many years...
- Mice hit the lever to administer stimulation (SUPER REWARDS) to the midbrain to the exclusion of all their mouse responsibilities and obligations



Mice get addicted to SUPER REWARDS but...

- Mice don't have morals
- Mice don't have religion
- Mice aren't sociopaths
- Mice don't have bad parents
- Mice are not a product of the public education system



IN ADDICTION, SUPER REWARDS CAUSE THE BRAIN TO 'REWIRE'

- NEW!!! #1 SUPER REWARD!!!

- #2 Eat

- #3 Kill

- #4 Sex

dis·ease
/də'zēz/

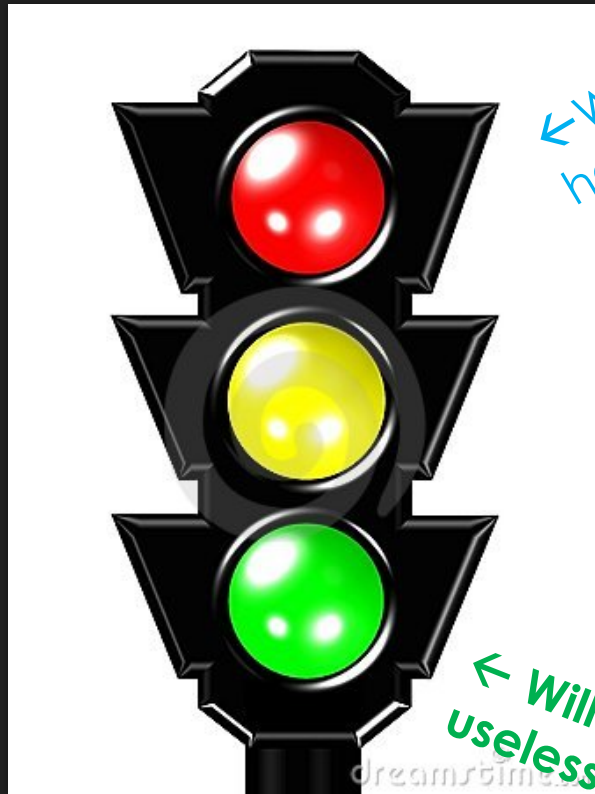


People dying of thirst in the desert will risk losing everything they value for a drink of water → this is the midbrain in action shutting down the frontal cortex in an effort to SURVIVE

SUPER REWARDS BECOME EQUIVELANT WITH SURVIVAL

But what about...

- “My uncle Marty says he used crystal meth for 10 years and then just stopped and never used again... he says all you need is willpower”

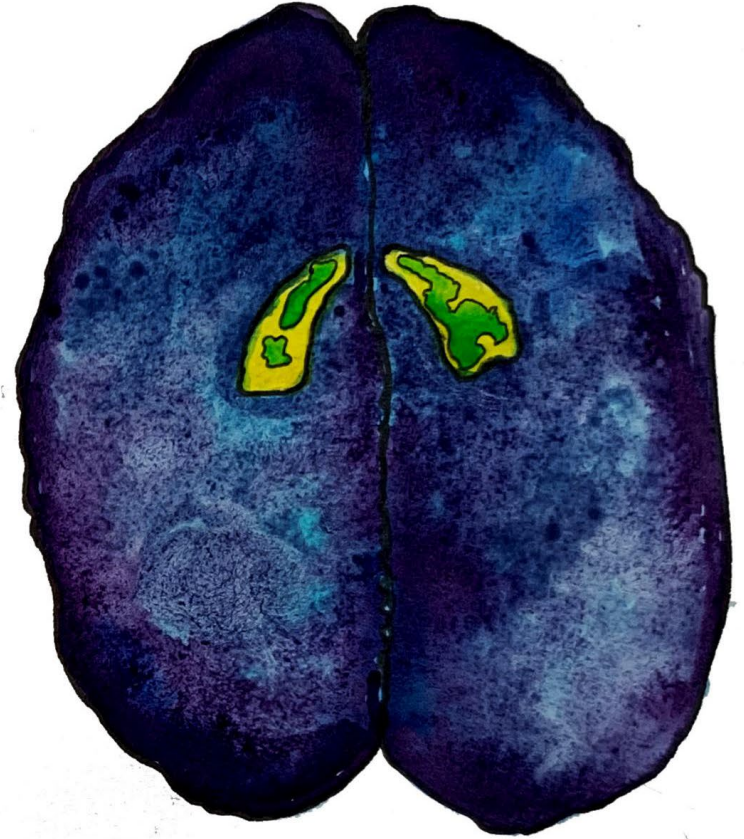
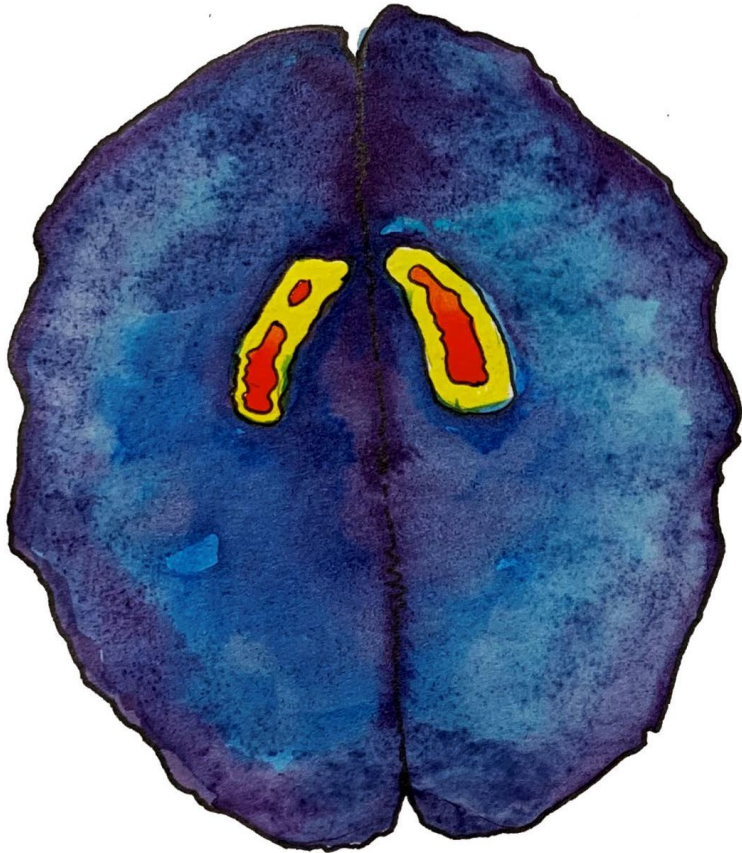


← Will power works here

← Will power is useless here

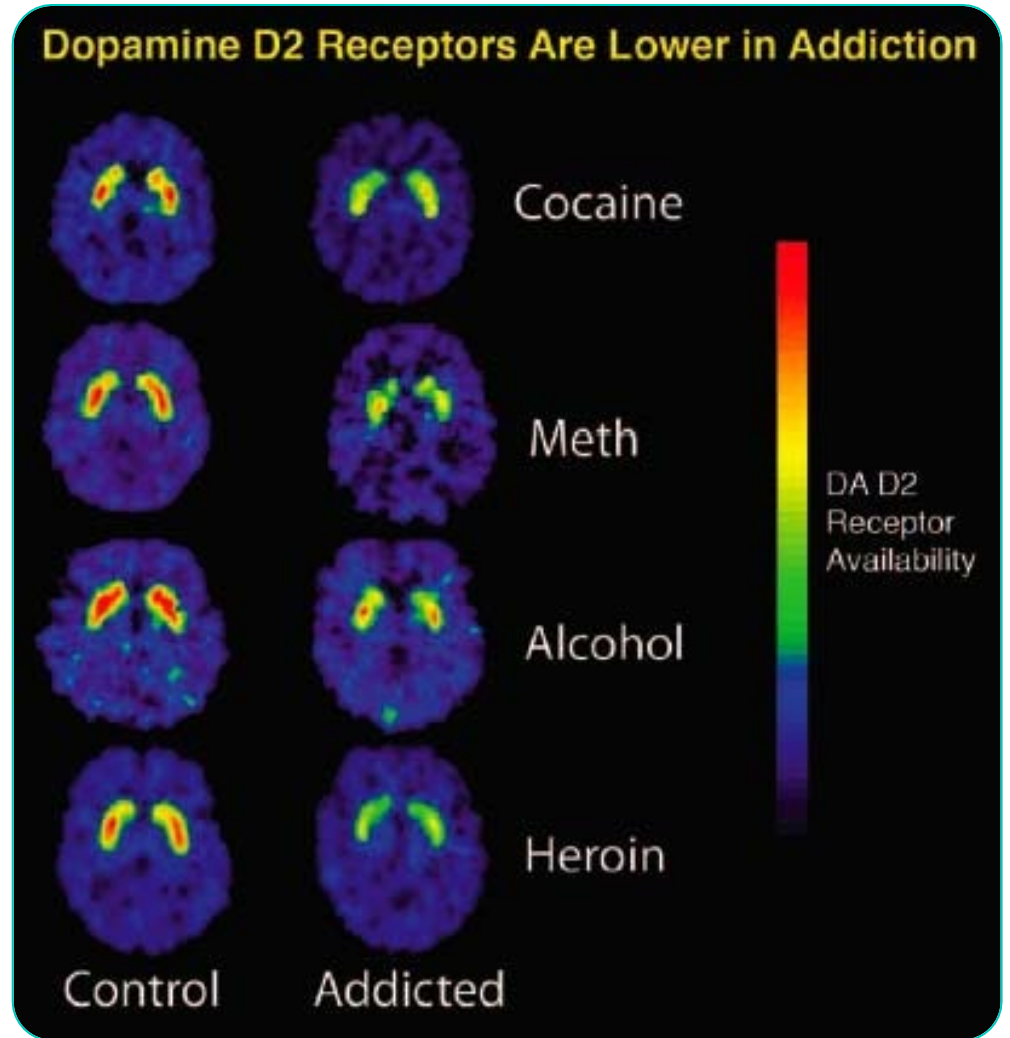
SHOW THE INDIVIDUAL THEIR DRUG OF CHOICE WHILE IN A BRAIN SCANNER...

- The non-addict will show activity in the frontal cortex
 - THINKING about how the drug is “good” or “bad”
- The addict will show activity in the midbrain and very little activity in the frontal cortex
 - CRAVING/SURVIVAL



Cortex changes

Midbrain changes

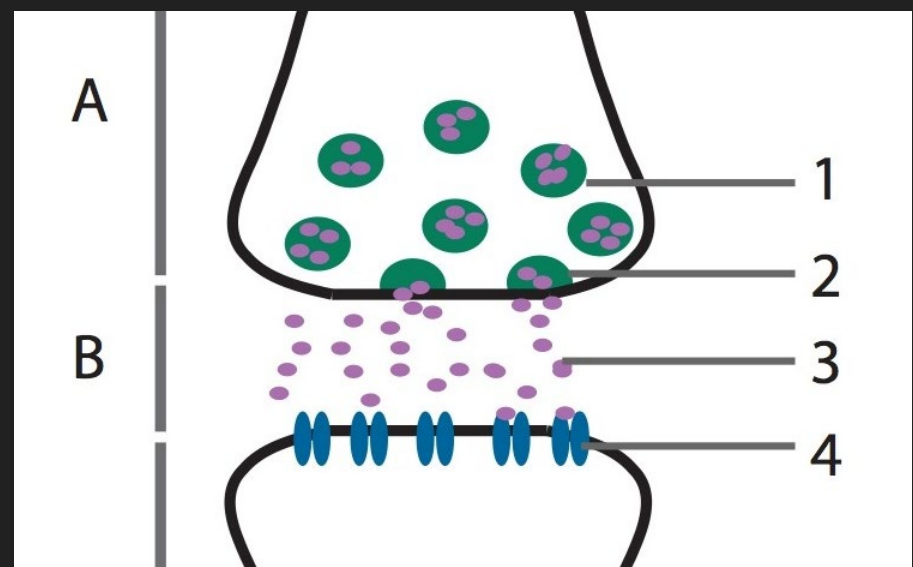
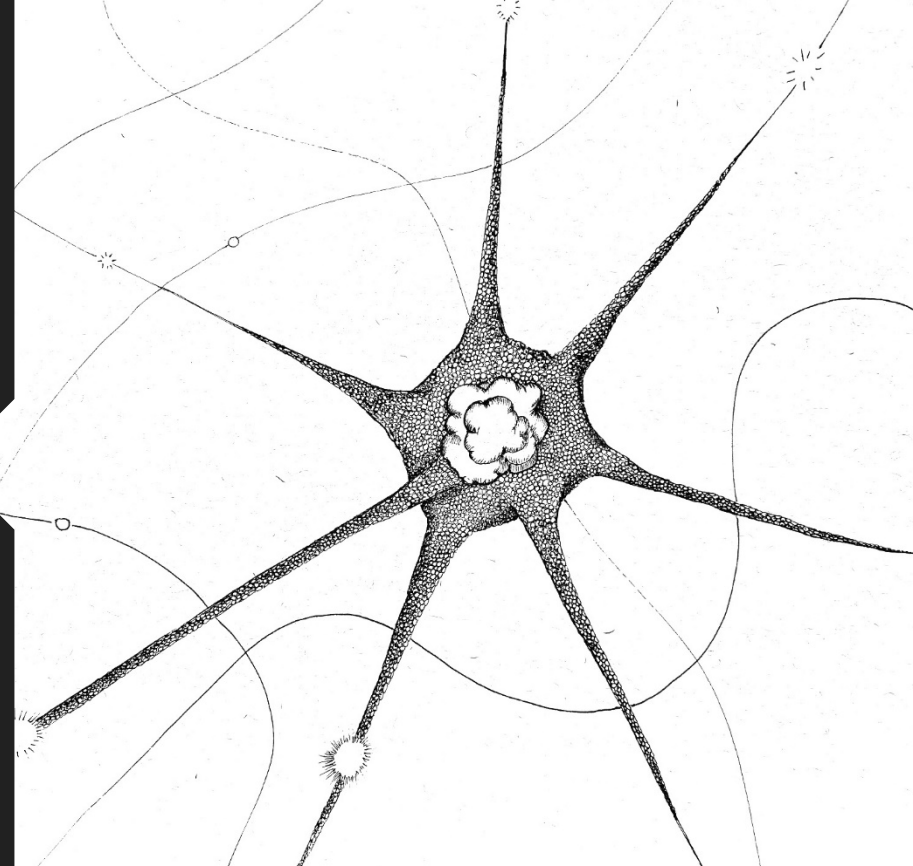


GET ON WITH THE DISEASE PROCESS ALREADY

ADDICTION IS A BROKEN 'PLEASURE SENSE' IN THE BRAIN

HOW THE BRAIN WORKS...

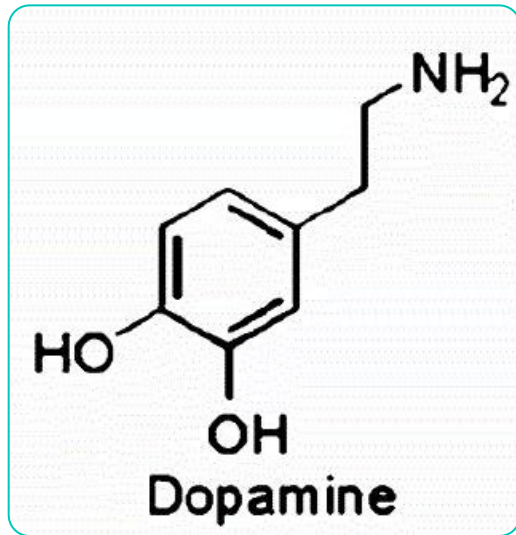
- A= presynaptic neuron
 - B= synapse
 - C= postsynaptic neuron
-
- 1. neurotransmitter(NT) in vesicle
 - 2. NT being released/taken back up
 - 3. receptor for NT= effects!!!



HOW THE BRAIN WORKS:

Brain Perceptual Systems (all of them):

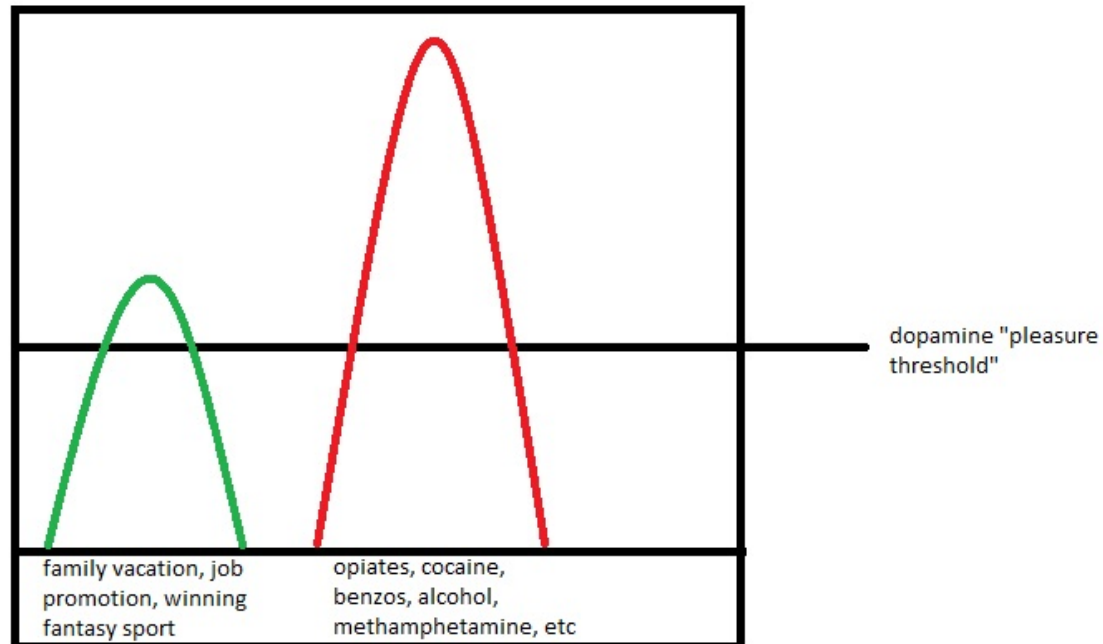
- 1. Vision
- 2. Hearing
- 3. Touch
- 4. Smell
- 5. Taste
- 6. Linear Acceleration
- 7. Angular Acceleration
- 8. Gravity (Proprioception) ← perceptual construct
- 9. Blood pO₂ and pCO₂
- 10. Pleasure ← perceptual construct

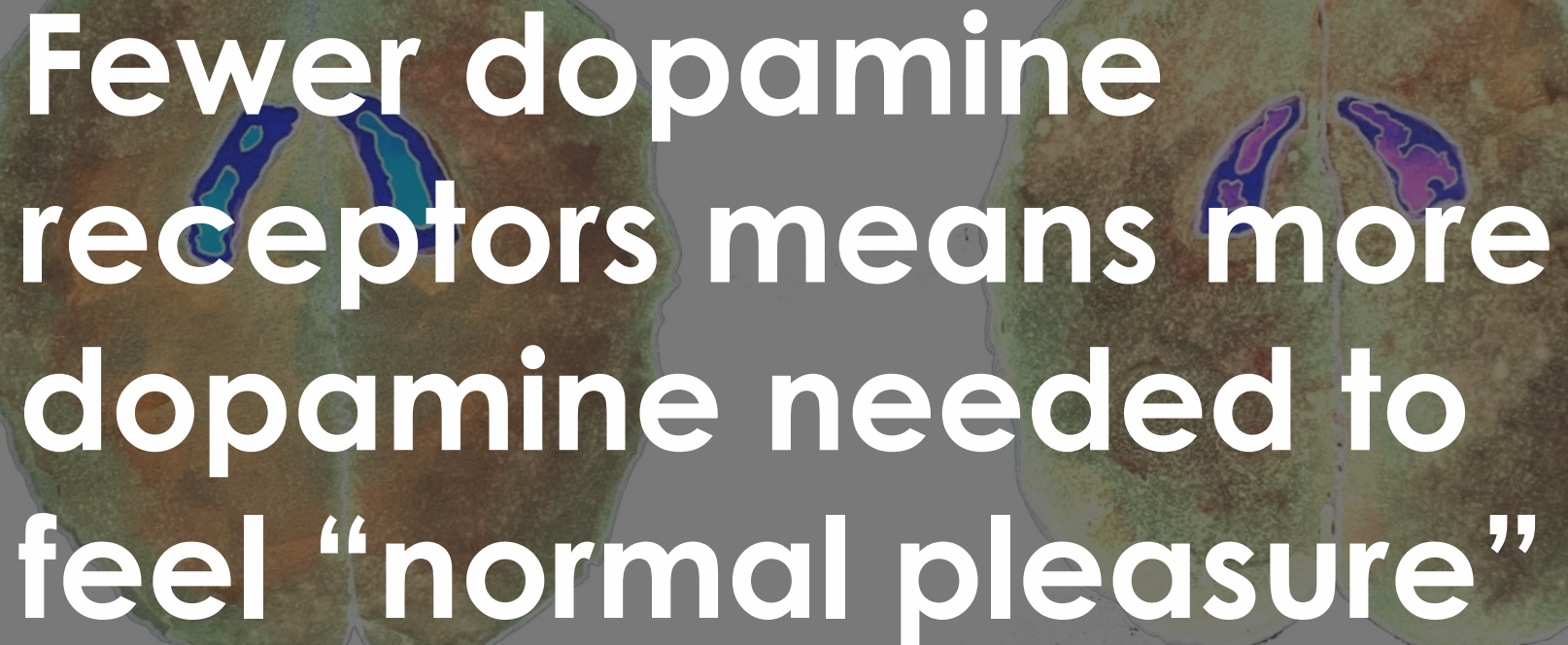


- •All drugs of abuse and potential compulsive behaviors release Dopamine
- •Dopamine is first chemical of a pleasurable experience - at the heart of all reinforcing experiences
- •DA is the neurochemical of salience (it signals survival importance)
- •Tells the brain this is “better than expected”

Addiction Neurotransmitter #1: Dopamine
ONE OF THE ONLY THINGS IN LIFE WE ENJOY

The Brain has a Hedonic “Set Point”



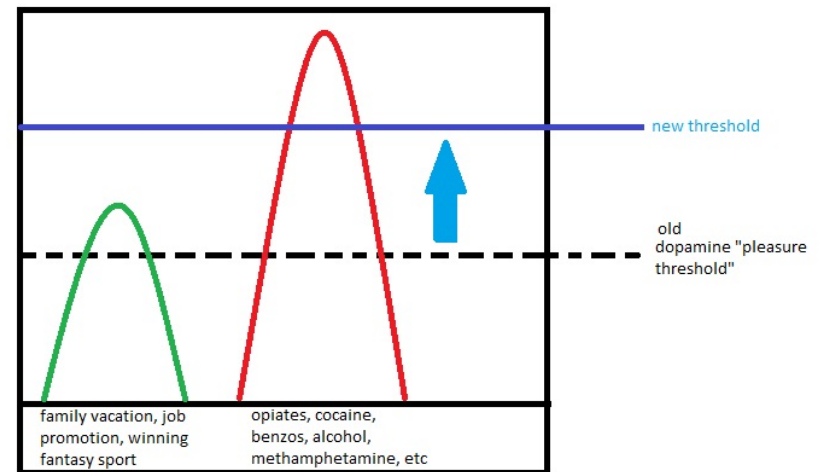


Fewer dopamine
receptors means more
dopamine needed to
feel “normal pleasure”

control

addicted

Increased
drug use
reset
the brain's
pleasure
“set point”



Addiction Neurotransmitter #2: Glutamate

THE EXECUTIVE ASSISTANT TO DOPAMINE

- •THE MOST ABUNDANT NEUROCHEMICAL IN THE BRAIN
- •CRITICAL IN MEMORY FORMATION & CONSOLIDATION
- •ALL DRUGS OF ABUSE AND MANY ADDICTING BEHAVIORS EFFECT GLUTAMATE WHICH PRESERVES DRUG MEMORIES AND CREATES DRUG CUES (TRIGGERS, PEOPLE, PLACES AND THINGS)
- •AND ... GLUTAMATE IS THE NEUROCHEMICAL OF “MOTIVATION” (IT INITIATES DRUG SEEKING)

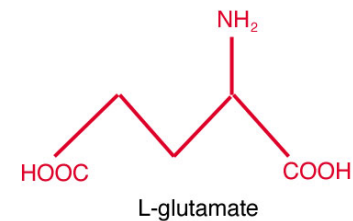


Fig. 1. Structure of the glutamate molecule.

PEOPLE and PLACES and THINGS, OH MY

TRAUMA DRAMA

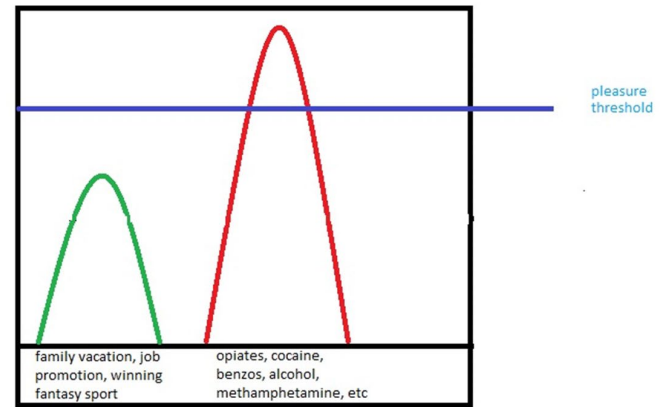
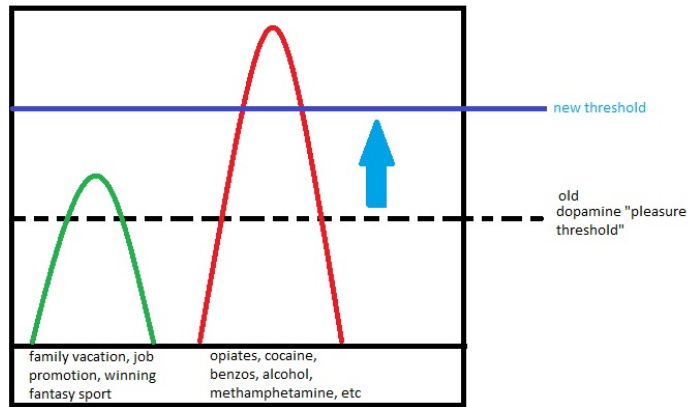
CHRONIC, SEVERE STRESS = \uparrow CRF



```
graph TD; A[CHRONIC, SEVERE STRESS = ↑CRF] --> B[And ↑CRF = ↓DAD2 receptors]; B --> C[And ↓DAD2 receptors = Anhedonia (BROKEN PLEASURE SENSE)];
```

And \uparrow CRF = \downarrow DAD2 receptors

And \downarrow DAD2 receptors = Anhedonia
(BROKEN PLEASURE SENSE)



High stress hormone levels ALSO reset the brain's pleasure "set point"

Anhedonia: Pleasure “deafness”



- The patient is no longer able to derive normal pleasure from those things that have been pleasurable in the past



- Addiction is a stress-induced “hedonic dysregulation”

use of 'activating'
substance x
activating number
of uses

gene activated
("turned on")

use of ANY dopamine
releasing substance

gene
present



midbrain changes
occur (down regulation
of dopamine
receptors--> increased
threshold for pleasure)



THE SKINNY ON GENES (NOT TO BE
MISTAKEN FOR SKINNY JEANS)

Relapse

1. Brief exposure to **ANY** abusable drug **OR** compulsive behavior (**DA release and DA receptor down regulation**)
2. Stress (**CRF release and DA receptor down regulation**)
3. Exposure to drug cues (**people, places and things**)

THREE THINGS ARE KNOWN
TO CAUSE RELAPSE IN
HUMANS

- **Now that the midbrain has found what secures survival...**
- *... how does it motivate the individual to repeat that behavior?*

**OKAY, FINE,
HOW DOES
THIS EXPLAIN
ALL THE
SHENANIGANS**

craving

- Increased stress = increased pleasure threshold = increased need for dopamine = midbrain thinks it is dying = CRAVING
- CRAVING is a physiological response to a neurochemical deficiency resulting in symptoms including sweating, stomach cramps, obsession, increased respirations, etc.
- CRAVING IS THE REASON THE “CHOICE” ARGUMENT FAILS.
 - No person can choose to crave or not.
 - **You don't actually have to have drug use for the defective physiology of addiction to be active**



Once Craving sets in, how does it control behavior??? (A.K.A the shenanigans)

- The midbrain (like a ninja) hijacks the abilities of the frontal cortex...
 - The brain will utilize the most likely reasoning to get the addict to feel like they have to use
 - Pain (won't cause death)
 - Anxiety (won't cause death)
 - Stress (won't cause death)
 - Specific people or events/reservations (ALWAYS a choice)
- Brings the 'reason' up to the level of the conscious... so when the craving passes (time or use)...

A close-up, slightly blurred image of a traffic light. The light is oriented vertically. The top lens is red, the middle lens is yellow, and the bottom lens is green. The green lens at the bottom is illuminated, showing a bright green glow. The other two lenses are dark. The background is a solid grey color.

And the 'reason' becomes
the 'green light'

And willpower is rendered
useless

Once there is a “reason”, suddenly behaviors become “justified”



LYING/STEALING



MANIPULATING



REASONING/MAKING
EXCUSES



RATIONALIZATION



JUSTIFICATION



This is what “WE” see

SO WHAT'S GOING ON IN THE CORTEX?

- SKILL SETS ARE BUILT OVER TIME, WITH PRACTICE
 - THINK OF A PATH THROUGH THE WOODS
- DRUGS/MALADAPTIVE COPING MECHANISMS REPLACE EXISTING PATHWAYS AS THEY ARE DEEMED 'MORE APPEALING'
 - THINK: INSTANT, HIGHLY REWARDING
- EXISTING PATHWAYS (IF THEY WERE PRESENT AT ALL) DETERIORATE IN FAVOR OF THE HIGH DOPAMINE COPING
 - CAN'T ACCESS THEM EASILY

THIS IS EVIDENCED BY THE FACT THAT ONCE THE MALADAPTIVE BEHAVIORS BECOME HABITUAL COPING SKILLS, THOSE SKILLS BECOME PART OF THE DISEASE



The need for instant gratification

And subsequent inability to wait or practice



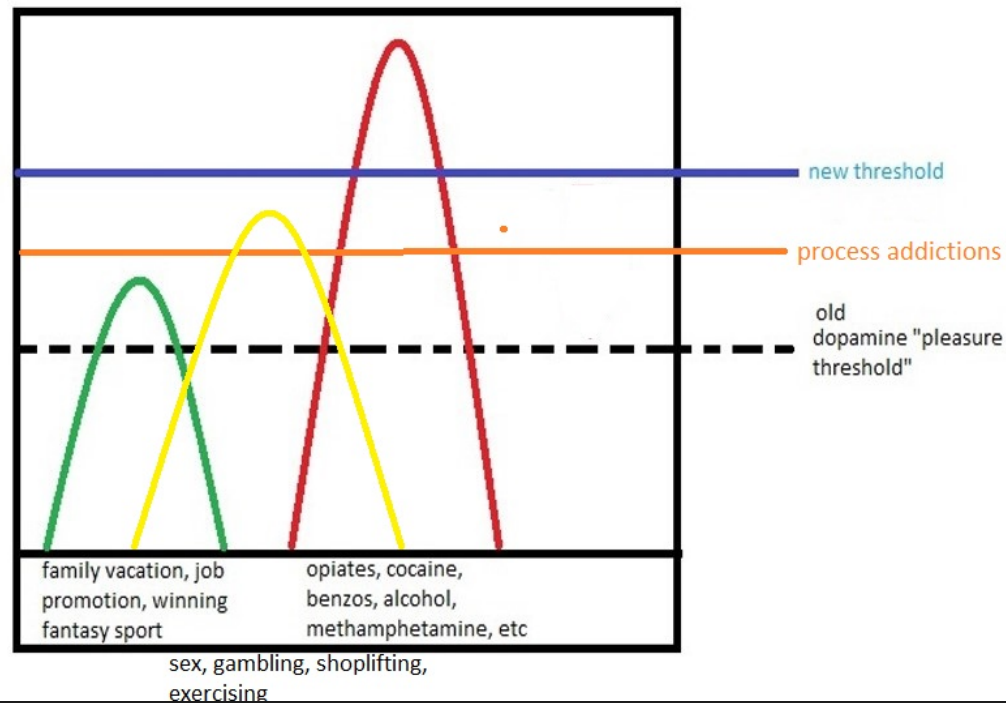
Needing a pill or chemical for EVERYTHING - while OTC sleep medications have few addictive properties, the BEHAVIOR of needing something to make the body do what it should naturally learn to do, IS addictive



Looking for reasons to avoid recovery related behaviors and activities

Seeking reasons to use

ADDICTIONS BEYOND DRUGS



THE DISEASE MODEL... I DIDN'T FORGET, YOU FORGOT

- Addiction is a dysregulation of the midbrain dopamine (pleasure) system due to unmanaged stress resulting in symptoms of decreased functioning IN BOTH the midbrain and the cortex, Specifically:

- 1. Loss of control

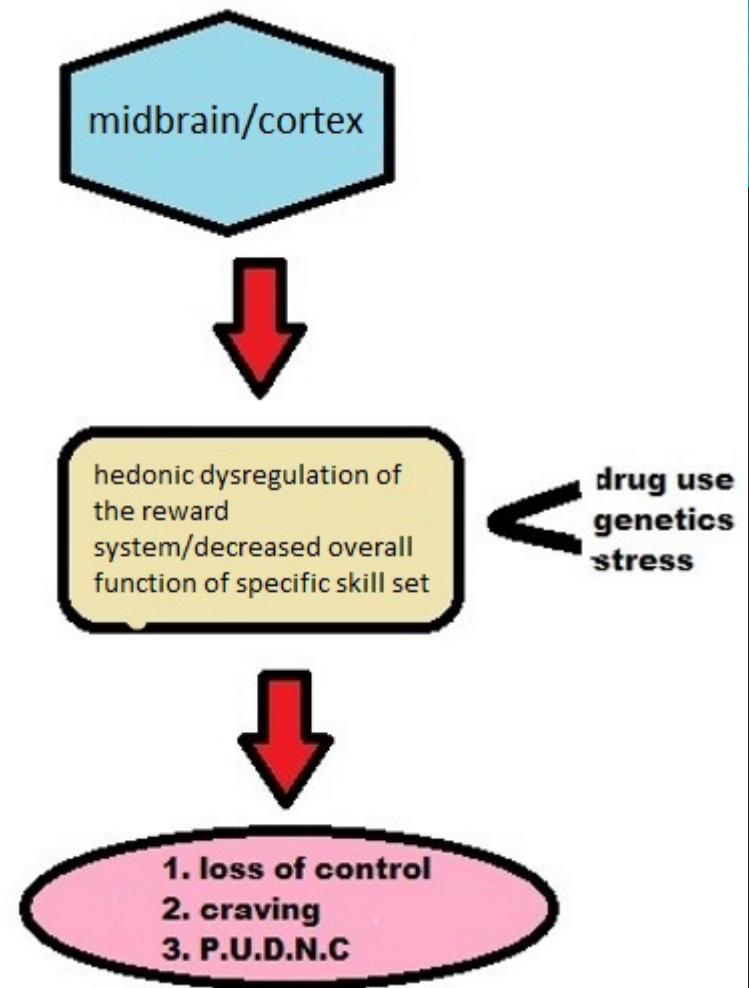
- 2. Craving

- 3. Persistent drug use despite negative consequences

ADDICTION IS A DISEASE...

BUT HOW DO WE KNOW??

THE DISEASE MODEL



IF I BUY INTO
THE DISEASE
CONCEPT,
WILL YOU
TELL ME
HOW TO FIX
IT?



Treat most acute
medical issues first



Detox



(quiet the midbrain with
medication or
abstinence)



Restore cortex

BUT FIRST, DO NO HARM... NO, WAIT: FIRST, REDUCE HARM

Strategies and ideas aimed at reducing harm

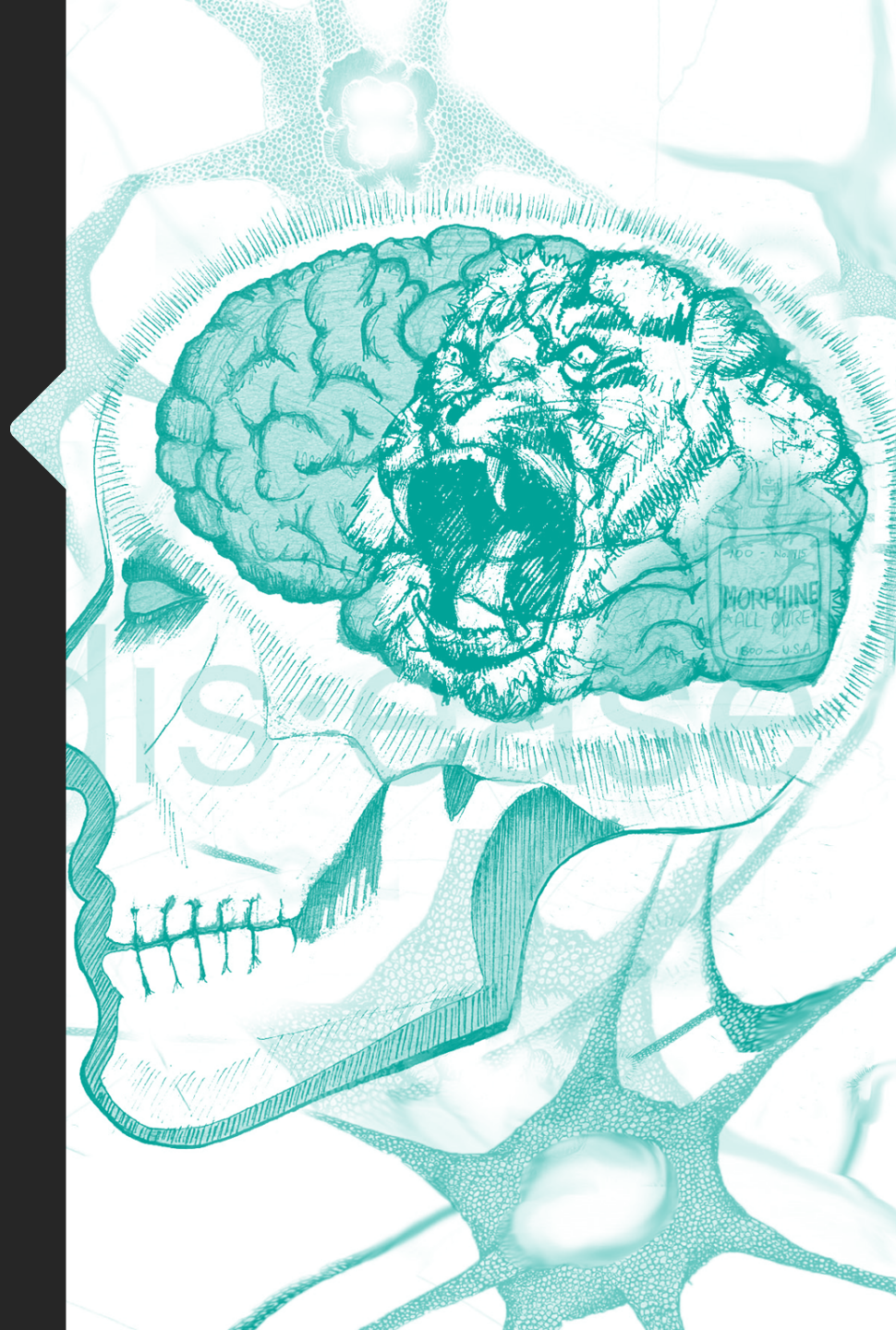
- Needle exchange
- Fentanyl testing strips
- Safe injection sites
- Free condoms
- Narcan availability (naloxbox)
- Drunk driving laws (they are NOT zero tolerance)

Movement for social justice and reduction of stigma

- Reduce/remove the need for anyone to have opinions on anyone else's journey to recover
- Establish quality of life for individuals with/without cessation
- Recognize real obstacles to recovery (poverty, racism, resource availability)
- Empower addicts to help themselves and each other

IT ALL BEGINS WITH DETOX

- ALCOHOL/BENZOS
 - Direct death
- OPIATES
 - Indirect death
- EVERYTHING ELSE
 - No death, but still sucks



THE DIVISION OF LABOR (not me)...

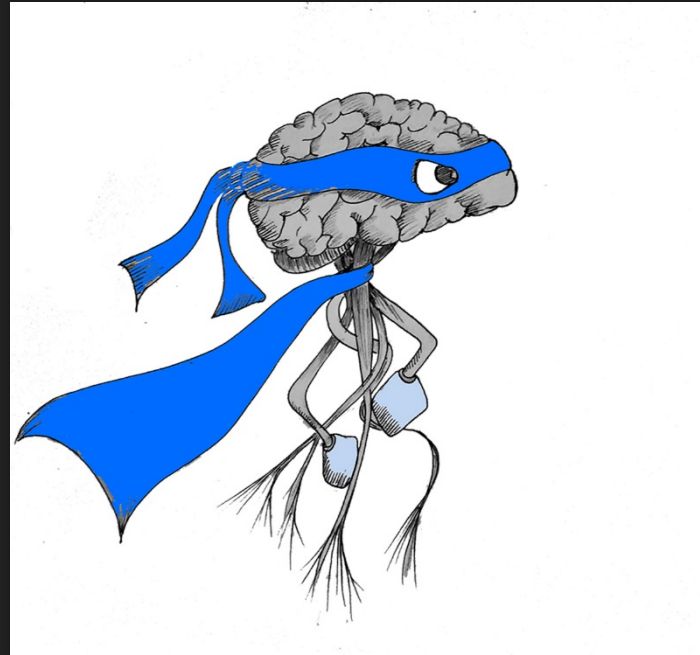
QUIET THE MIDBRAIN

Abstinence. Medication.

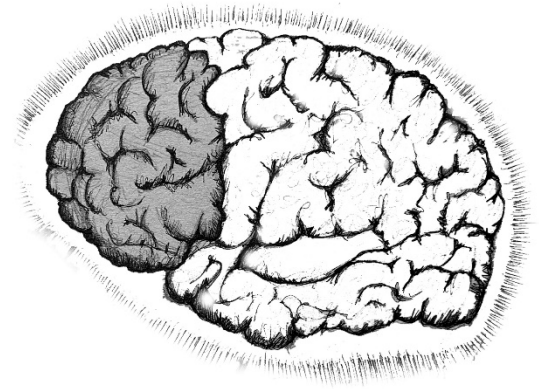


BUILDING THE CORTEX

Traditional treatment. 12 step groups. Spiritual growth



The Goal of
treatment-
regardless of
the drug or
length of use is
to RESTORE THE
CORTEX



THE CORTEX GOES TO THE GYM

COGNITIVE SKILL SETS

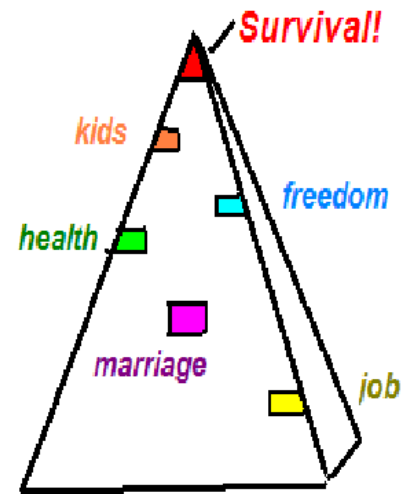
- We must build/rebuild pathways for appropriate coping skills
- We must provide tools to combat maladaptive coping skills
- We must provide a framework for continued treatment that supports a chronic disease model

SPIRITUAL SKILL SETS

- We must help them find personal meaning in other things
- We must help them develop emotional relationships with healthy PEOPLE
- We must help them develop a sense of self INDEPENDENT OF THE DRUG
- WE MUST HELP THEM FIND PURPOSE

Punishment doesn't work

- Pure abstinence
- No threat matches loss of survival
- No rebuilding of the cortex
- No skills for coping after the experience of punishment (traumatic in and of itself)
- It doesn't do ANY of the things listed on the previous slide



The Tasks of Addiction Treatment:

To give the addict workable,
credible tools to proactively
manage stress and
decrease craving

1. COPING SKILLS
2. STRESS RELIEF
3. SAFE ENVIRONMENT
4. SOCIAL SUPPORTS

The Tasks of Addiction Treatment:

For each individual addict,
find the thing which is more
emotionally meaningful than
the drug- and displace the
drug with it

1. SPIRITUAL GROWTH
2. PERSONAL DEVELOPMENT

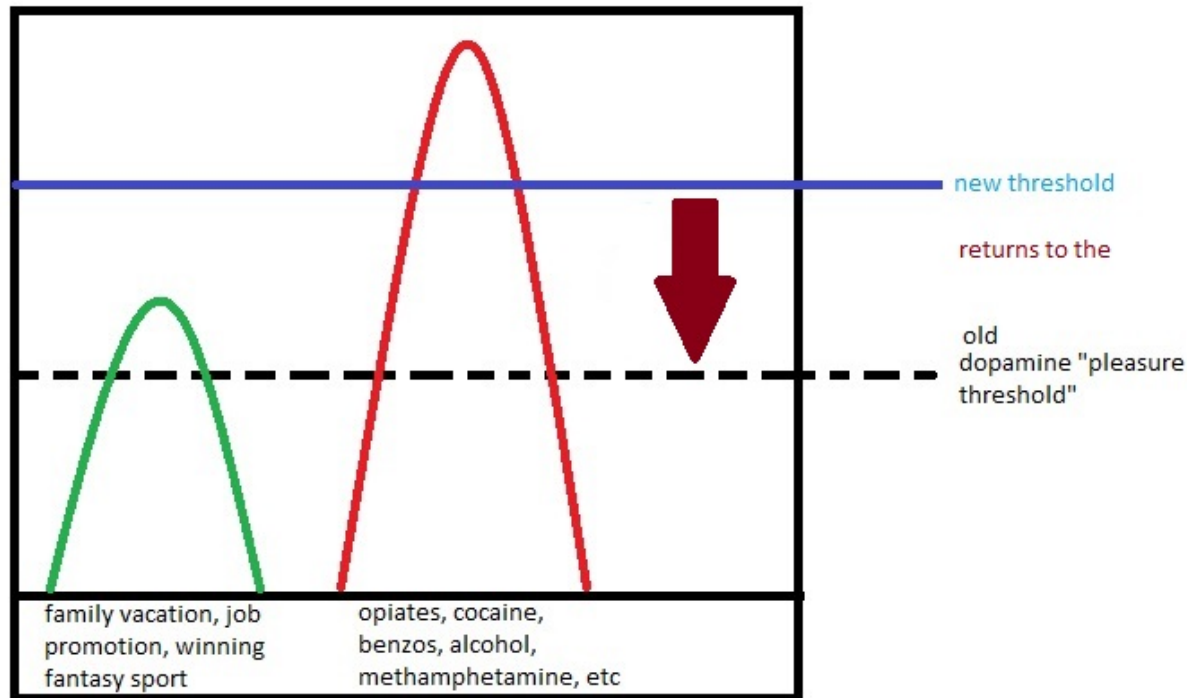
A TOOLBOX FOR CHANGE

CORTEX

- COUNSELING
 - 'HOW TO MAKE A DONUT'
- 12 STEP
 - 'SPIRITUAL GROWTH FOR DUMMIES'
- THRIVE
 - WELLNESS

MIDBRAIN

- ABSTINENCE
 - WHITE KNUCKLE
 - DRY DRUNK
- MEDICATION ASSISTED TREATMENT
 - As in, TREATMENT ASSISTED BY MEDICATION



- WITH ABSTINENCE OVER TIME, OR WITH MEDICATION, THE THRESHOLD RETURNS TO NORMAL (OR ALMOST NORMAL)
- IT IS FRIABLE
- IT WILL NOT STAY THERE WITHOUT DEVELOPMENT OF THE CORTEX

A chemical will not cure chemical dependency

- Medication should be used to stabilize the midbrain so that the work can be done in the cortex
- Without the constant spike of dopamine throughout the day, the threshold will come back to a level closer to normal
- Relying on a medication alone will likely result in relapse (on other substances first)

medications

alcohol

- Disulfiram (Antabuse)
- Acamprosate (Campral)
- Oral naltrexone (ReVia)
- Injectable naltrexone (Vivitrol)

opiates

- Oral naltrexone (ReVia)
- Injectable naltrexone (Vivitrol)
- Sublingual buprenorphine/naloxone (Suboxone, Zubsolv, Bunavail, Subutex*)
- Injectable buprenorphine (sublocade)
- methadone

*Subutex does not contain naloxone

COMBINATION THERAPY (THE ULTIMATE TOOLBOX)

-ALLOWING THE MIDBRAIN
TO 'REST' BUT
SIMULTANEOUSLY
STRENGTHENING THE
FRONTAL CORTEX

-ALLOWING THE
BEHAVIORAL AND
EMOTICO-MENTAL TOOLS
TO DEVELOP AND BE
PRACTICED IN A "LESS
STRESSFUL" ENVIRONMENT
(THE BRAIN)

Reconstructed... THRIVE

Recover

- A Chronic disease with a chronic timeline
- Relapse/remission/recovery can be like sliding back and forth
- Where do we go after 'recovery'

Reconstruction

- Improving all areas of wellness
- Nutrition
- Movement
- Mindfulness
- Savings (finances and memories/experiences)

A word about marijuana

- THC releases dopamine... just like alcohol, opiates, cocaine, benzodiazepines, etc
 - It will awaken the 'tiger' and trigger the inability to cope without chemicals and put the addict in a position of needing stronger chemicals to deal with larger stressors, ultimately leading back to the drug of choice
 - The "marijuana maintenance plan" used as a 'recovery tool' is a nonsensical approach created BY addicts FOR addicts
- THC is no more 'dangerous' to a NONaddict than prescription medication or alcohol
 - Some evidence supporting its use in some medical conditions

Family disease

- Addiction is a family disease
 - The addict's behaviors affect everyone in the family
 - The family becomes ADDICTED to the addict
 - Family treats the addict like the addict treats drugs (constantly thinking about them, adjusting their lives according to the addict, etc...)
 - This process occurs in the same place in the brain and needs to be treated the same
 - Alanon, Naranon, individual counseling for family members

Prevention...

- The truth is that we will never treat this disease to extinction
- We need to develop tools to prevent it.
- We can look at current treatment and utilize those strategies to help prevent it
- Addiction is an adolescent disease, so we must start there

PAGE of SHIT THAT NOBODY CARES ABOUT

except editors and maybe some academics. AKA works cited

- It has been about 2000 years since i was in any kind of academic situation where I had to properly cite my work. I have no recollection of proper formatting and am not going to relearn it.
- I have mentioned several books and their authors, they're mentioned in the actual text and/or footnotes, I am not repeating them here.
- I referred to a few government agencies that have websites you can look at, check the footnotes.
- I cited an article, also in the footnotes.
- All of the quotes used are either in the public domain or I have obtained permission prior to publication.
- That's the best you are going to get. Again, I accept full responsibility for the fact that this level of laziness makes me a shittier presenter.
- Have a nice day.
- You have to actually get the book if you want to know what I am talking about here

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Rd, Suite 105, Wooster

Millersburg: 34-C S. Clay St.

Millersburg

Questions????

Email me:

admin@theaddictsdoc.com

Or You can follow me:



@theaddictsdoc



@theaddictsdoc or Nicole Labor, Addiction Assassin



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