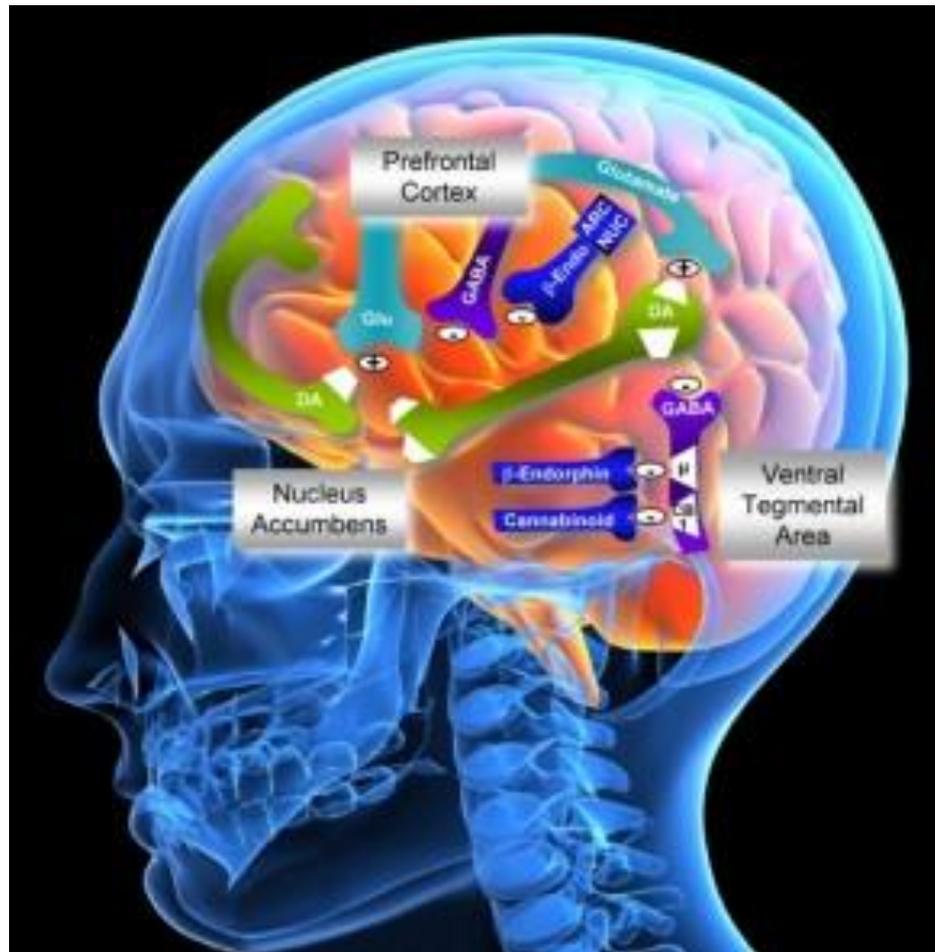
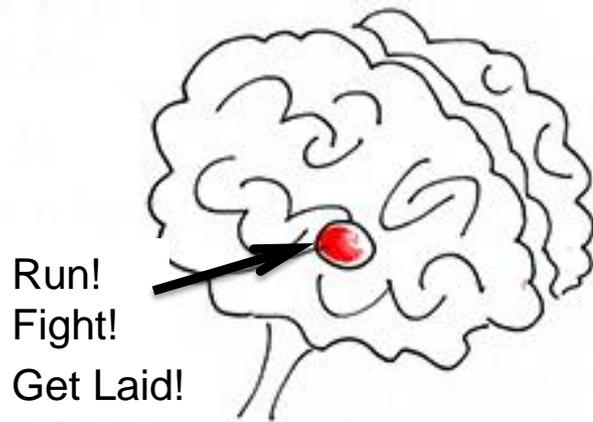


# CRITICAL BRAIN AREAS

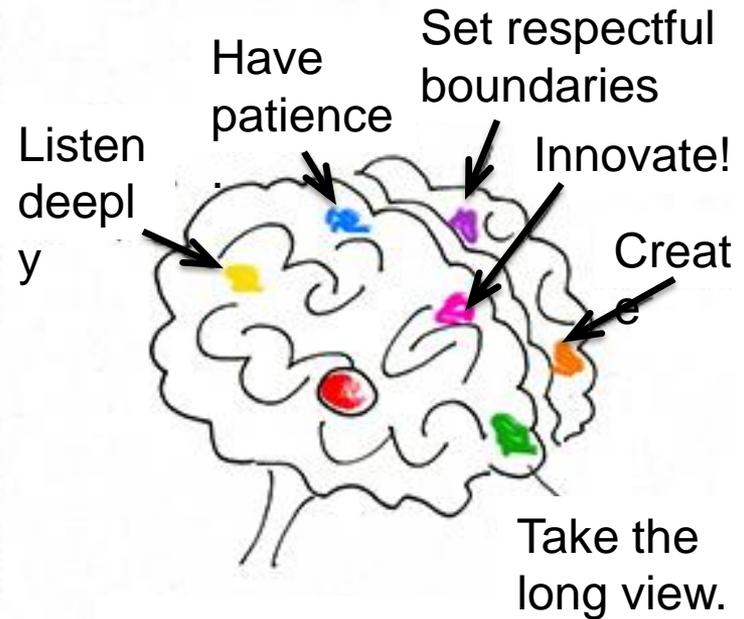


# EAT, DRINK, HAVE SEX (AND USE DRUGS)



Run!  
Fight!  
Get Laid!

Lizard brain advice



Listen  
deeply

Have  
patience

Set respectful  
boundaries

Innovate!

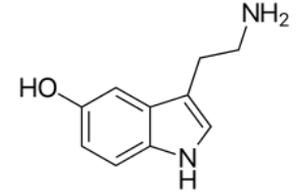
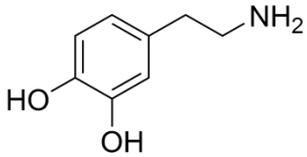
Create

Take the  
long view.

Cortex advice

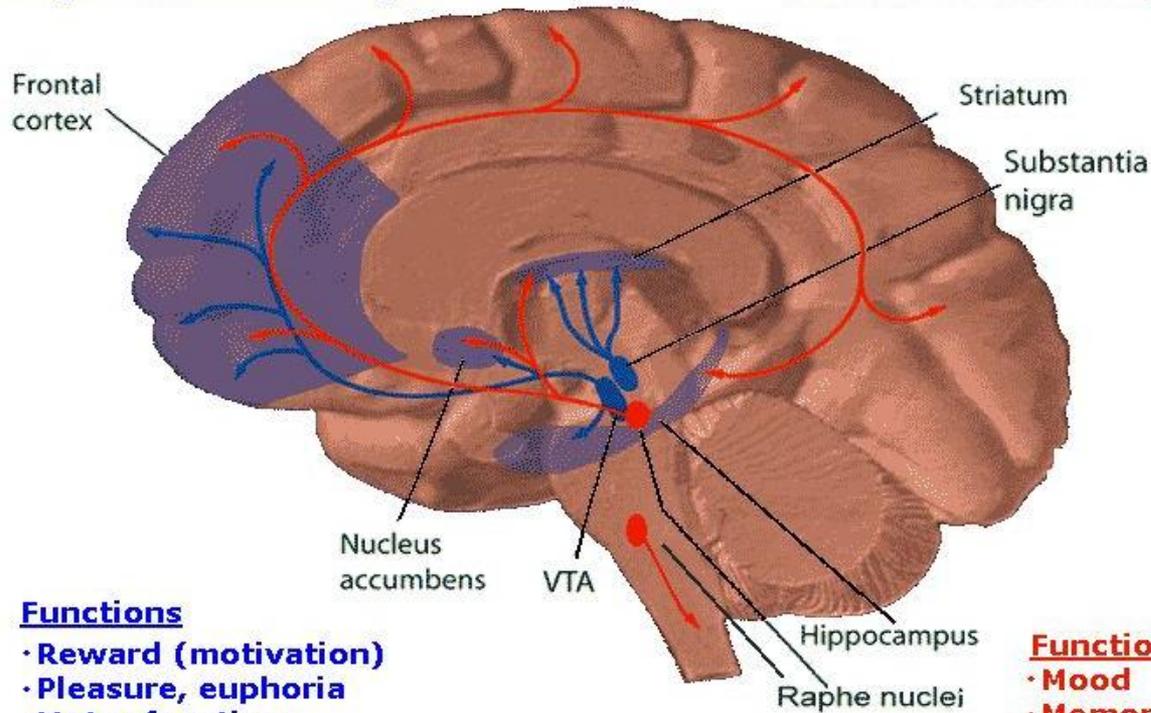
# DOPAMINE & SEROTONIN

## Location and Function



### Dopamine Pathways

### Serotonin Pathways



#### Functions

- Reward (motivation)
- Pleasure, euphoria
- Motor function (fine tuning)
- Compulsion
- Perseveration

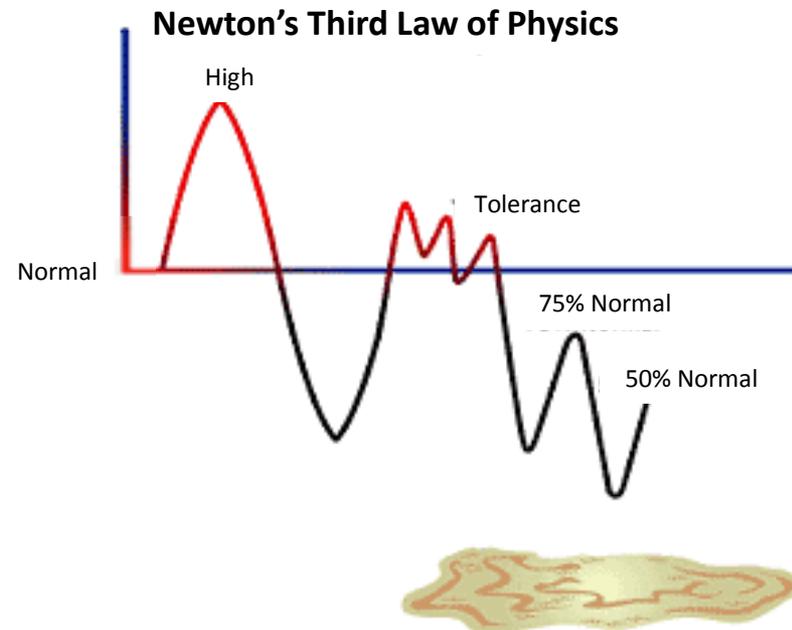
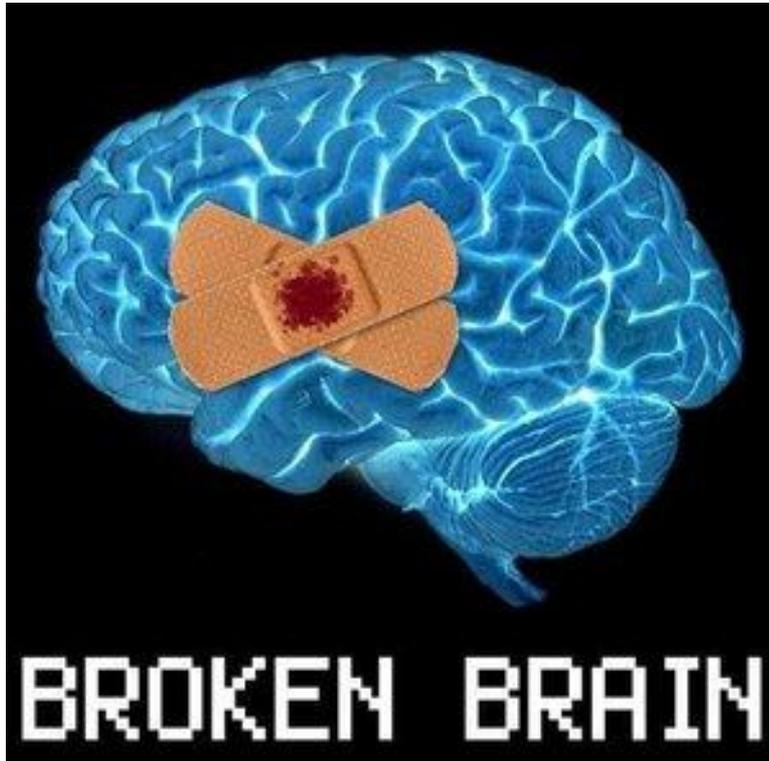
#### Functions

- Mood
- Memory processing
- Sleep
- Cognition

## Dopamine Levels

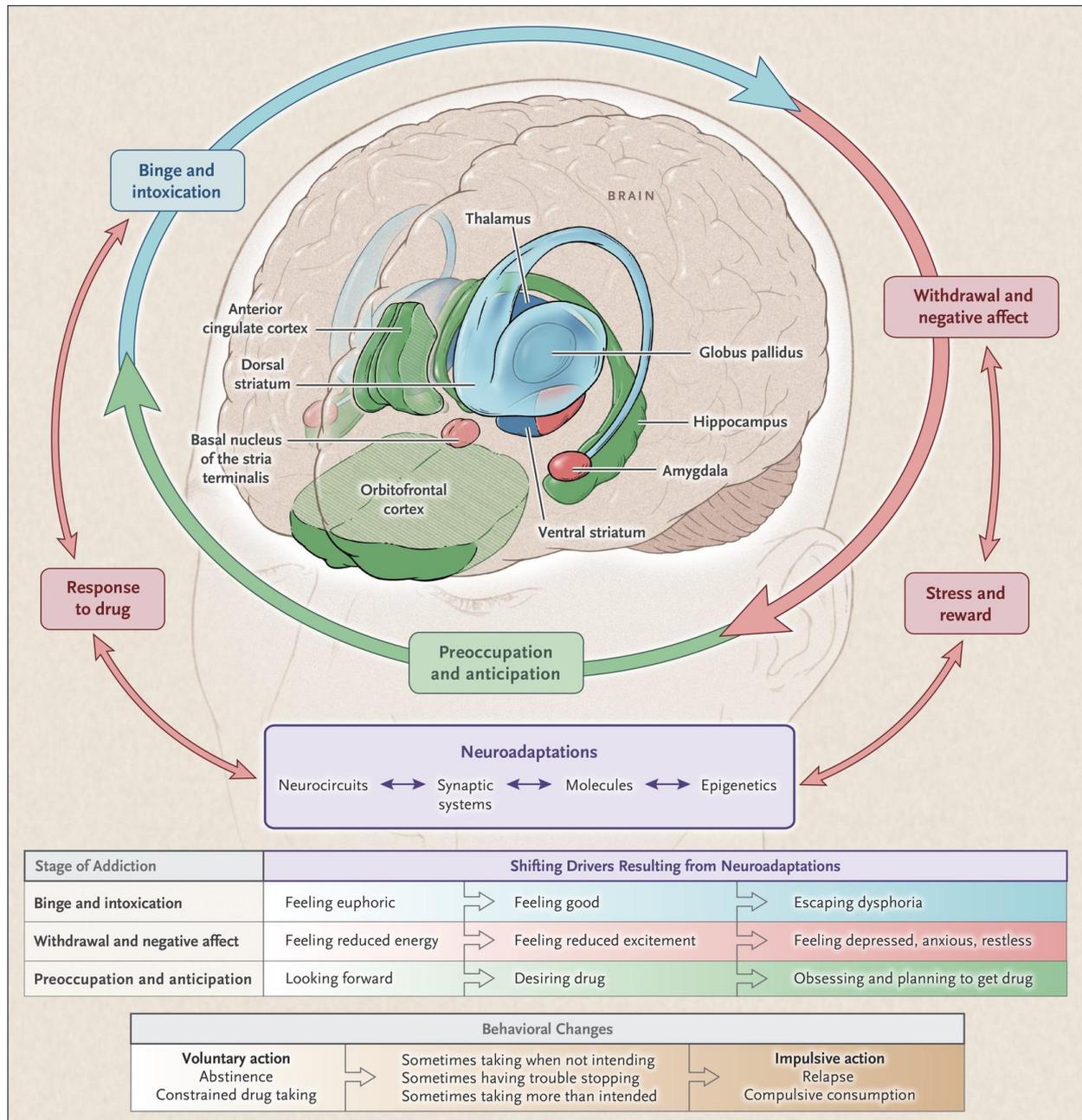


# Newton's 3<sup>rd</sup> Law of 'Drug Abuse'



*'For every action there is an equal and opposite reaction'*

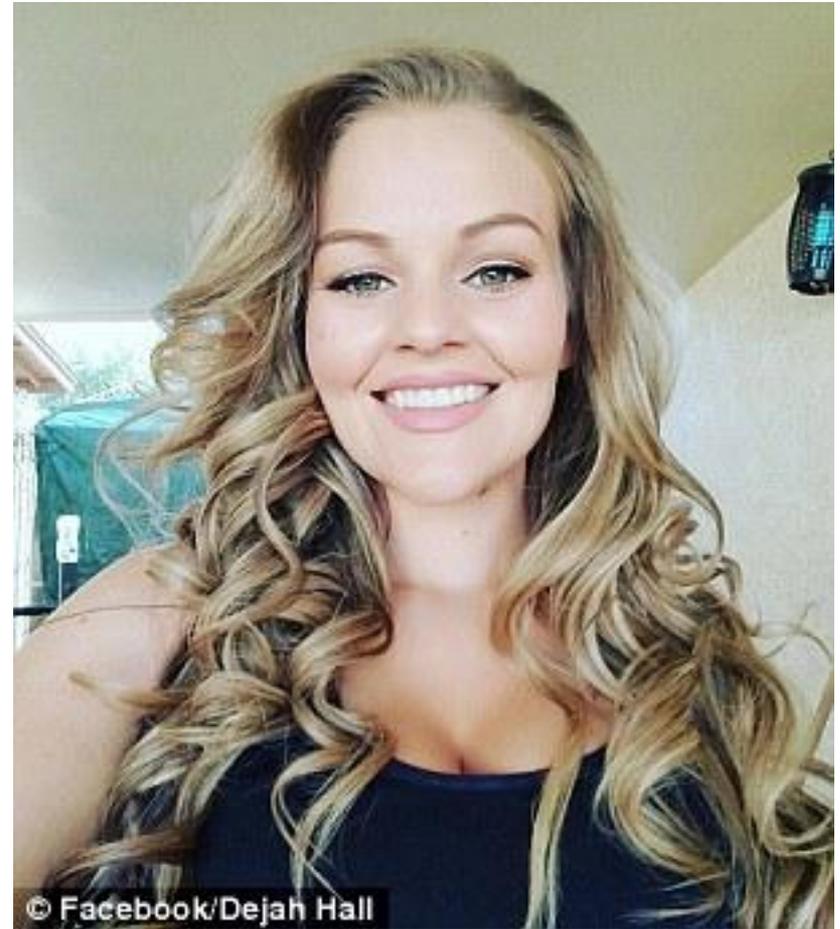
*Sir Isaac Newton*



Neurobiologic Advances from the Brain Disease Model of Addiction

Nora D. Volkow, M.D., George F. Koob, Ph.D., and A. Thomas McLellan, Ph.D.

N Engl J Med 2016; 374:363-371 [January 28, 2016](#)

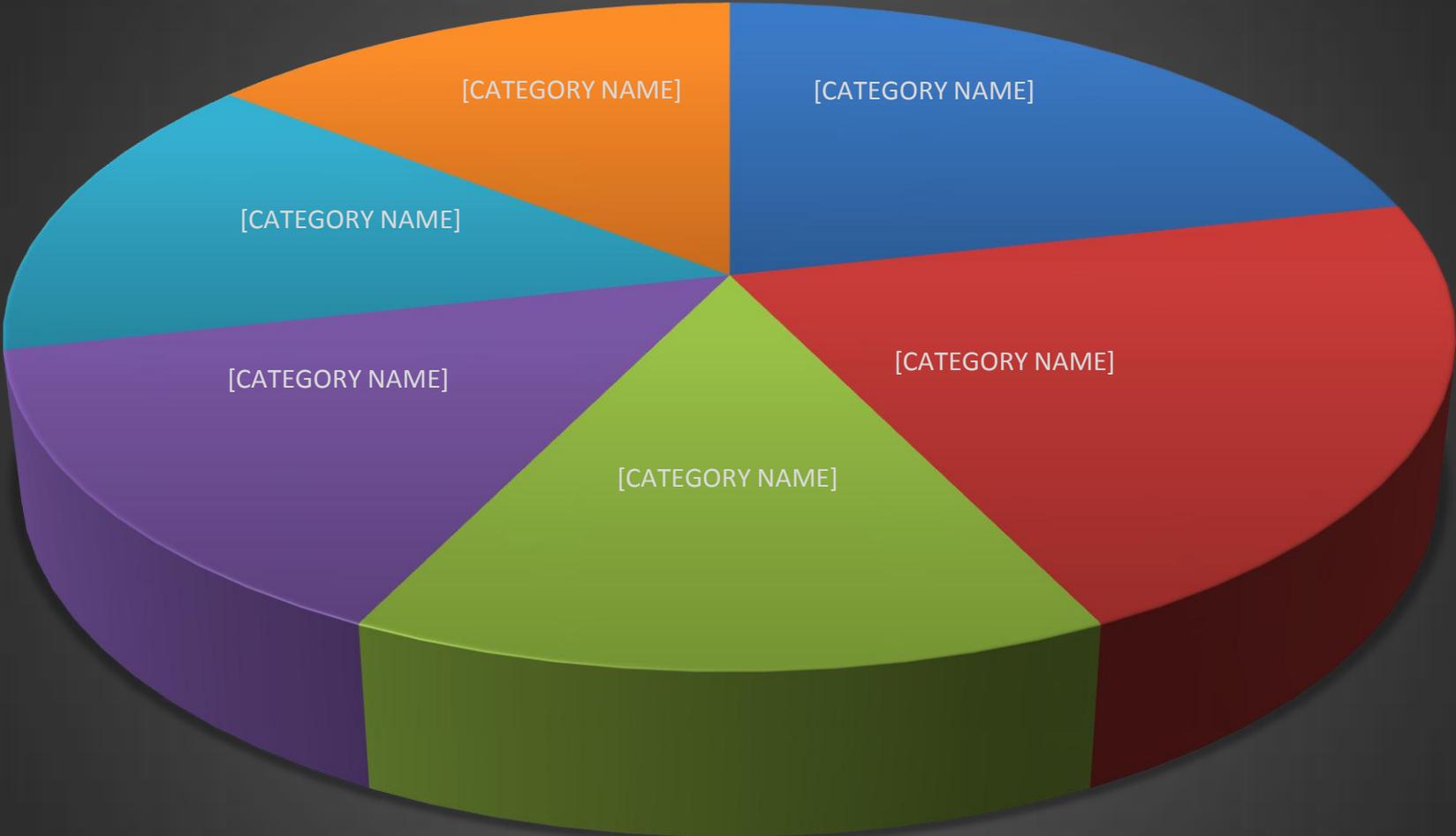


In early December, 26-year-old Dejah Hall, from Arizona, highlighted the harrowing effects of drug addiction by sharing her before-and-after photos on social media

Read more: <http://www.dailymail.co.uk/femail/article-4069526/Former-addicts-share-amazing-photos.html#ixzz4sEPHq7RE>

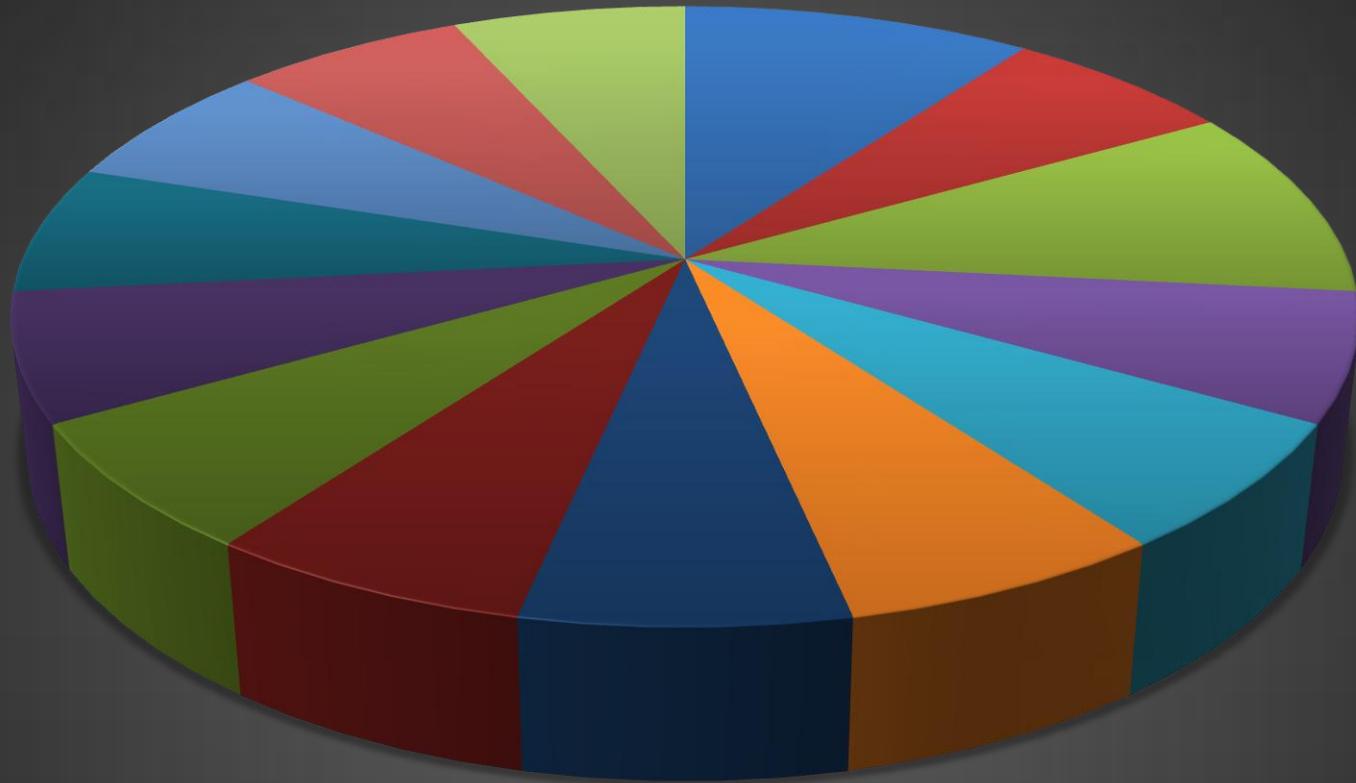
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# What It Takes To Get Better



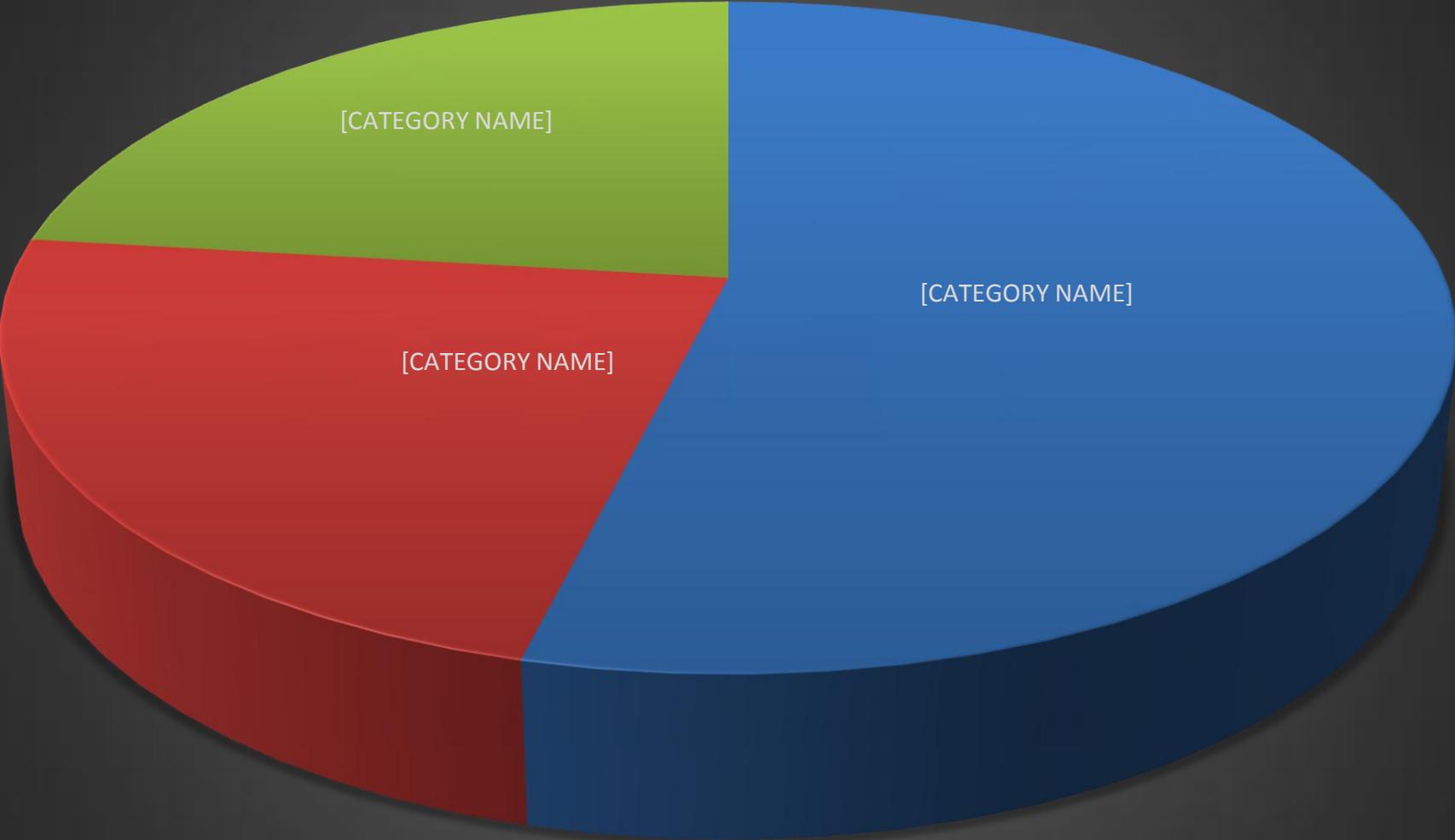
- Stable & Sober Housing
- Medicine
- Mental Health Treatment
- Positive Relationships
- Physical Movement
- Having a Sense of Purpose

# What It Takes To Get Better



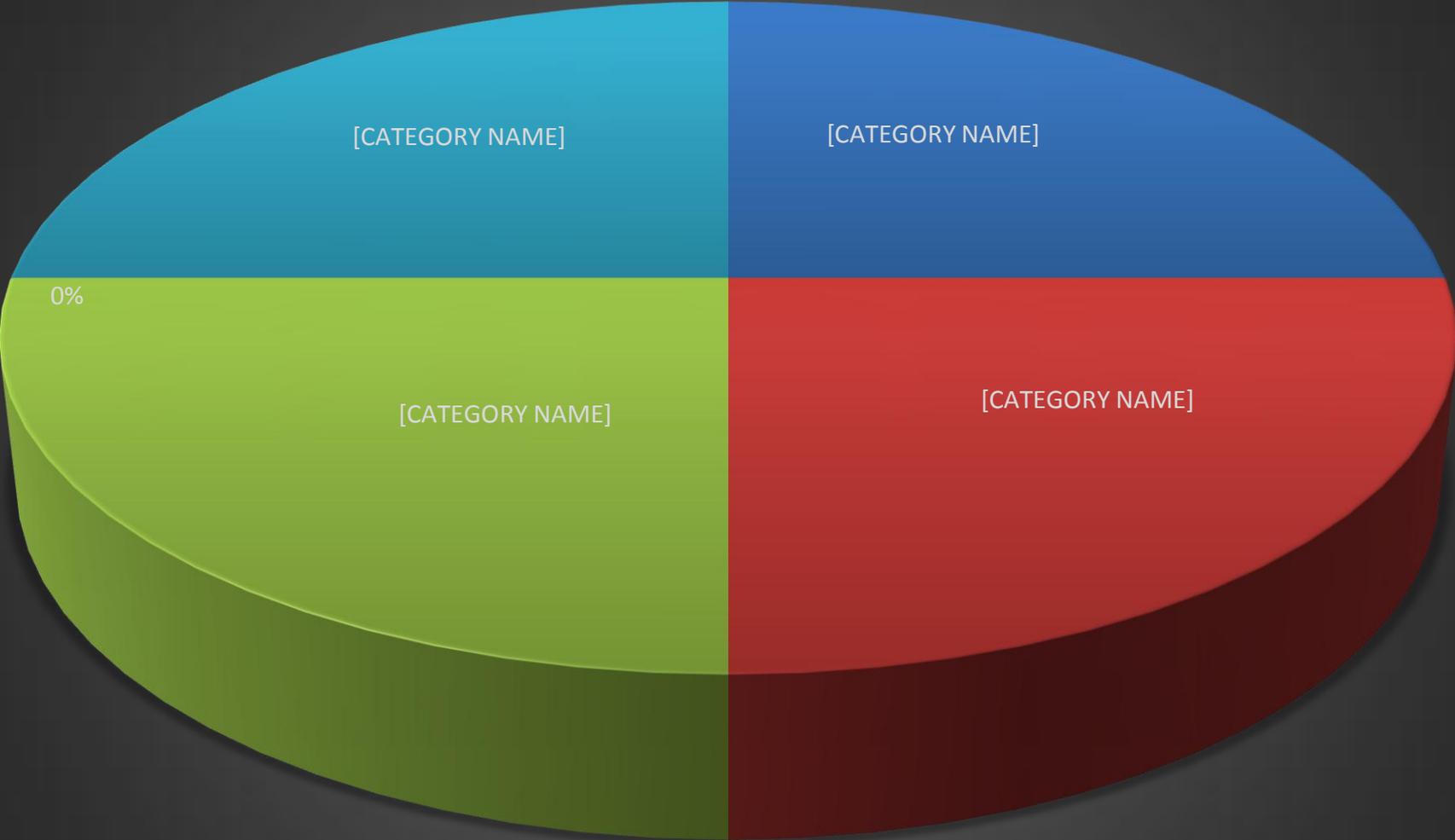
- |                             |                              |                           |
|-----------------------------|------------------------------|---------------------------|
| Stable & Sober Housing      | Having a Sense of Purpose    | Medicine                  |
| Mental Health Treatment     | Positive Relationships       | Physical Movement         |
| Working                     | Parenting                    | Going to 12 Step Recovery |
| Growing into an Adult Brain | Getting Treatment for Trauma |                           |
| Hope                        | Self Love                    | Feeling Accountable       |

# What It Takes To Get Better



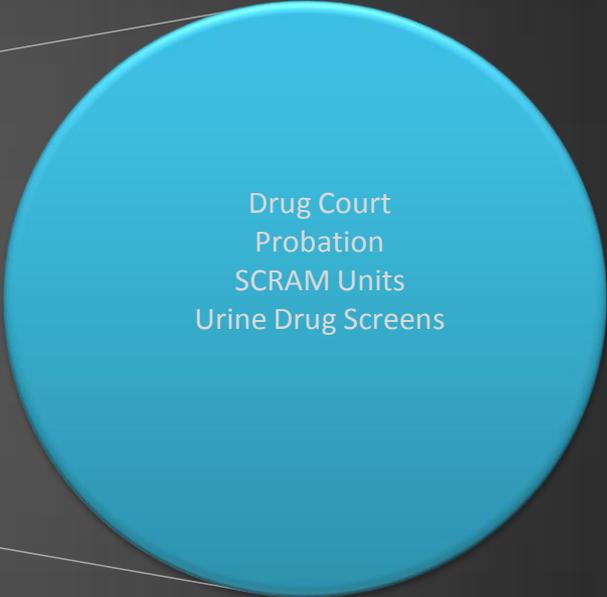
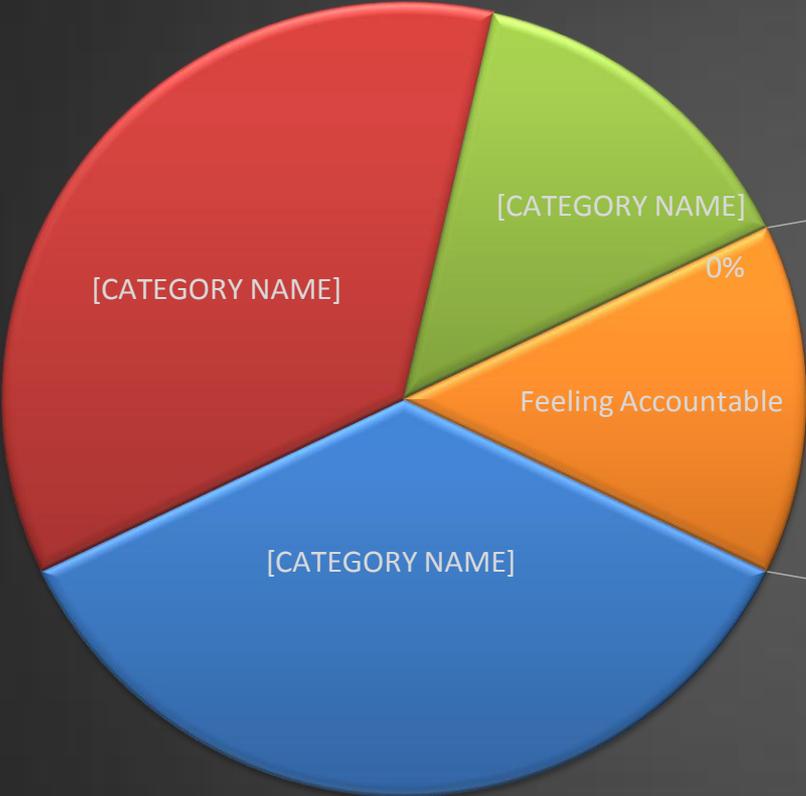
■ Stable & Sober Housing ■ Medicine ■ Work

# What It Takes To Get Better



▣ Stable & Sober Housing    ▣ Grow Into an Adult Brain > 24 yo    ▣ Self Love    ▣ Hope

# What It Takes To Get Better



- Stable & Sober Housing
- Mental Health Issues Addressed
- Medicine
- Feeling Accountable

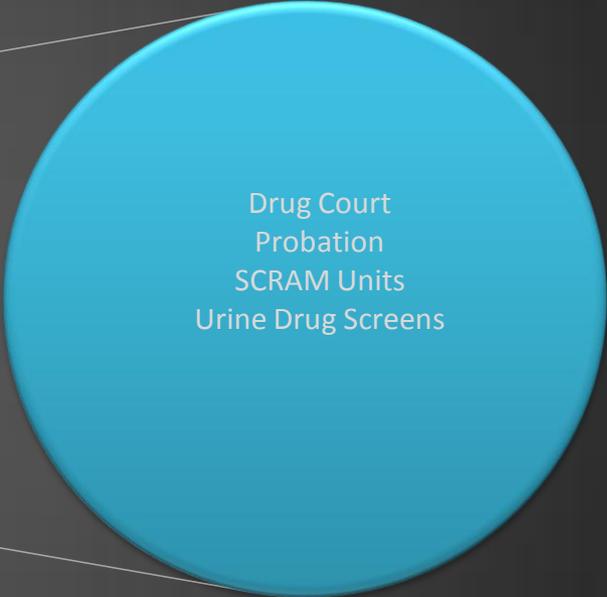
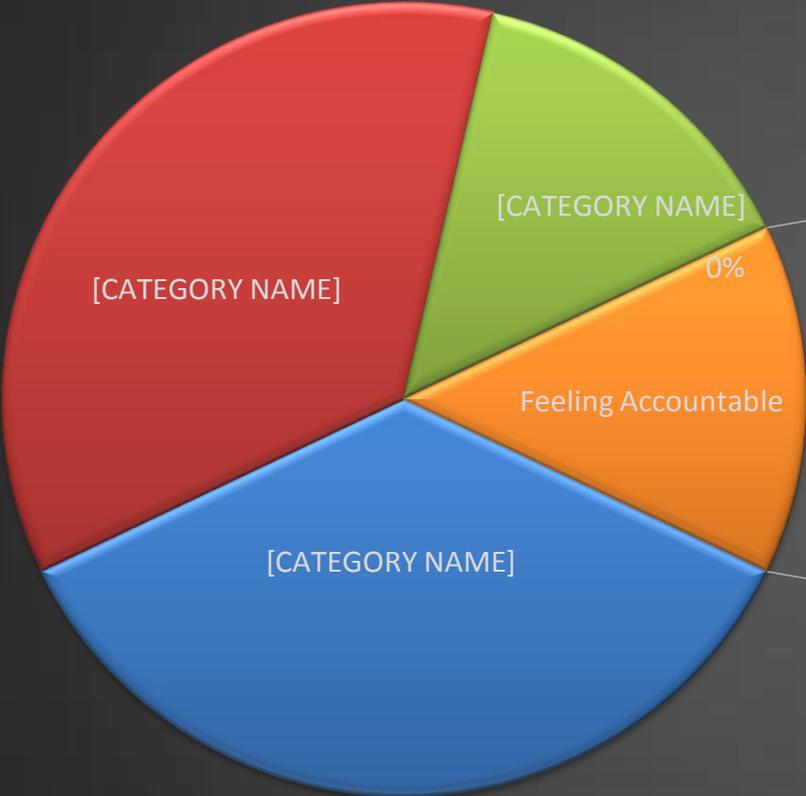


# Drug Court



- Accountability
  - Someone in your corner
  - Good advice about treatment
  - Makes connections to treatment
- So restrictive that folks can't do anything else that makes them better (hard to work, hard to move)
  - Bad advice about treatment

# What It Takes To Get Better



- Stable & Sober Housing
- Mental Health Issues Addressed
- Medicine
- Feeling Accountable

# Medical Monitoring for Adherence (aka: UDS)

## What Can Be Tested

- URINE
- SALIVA
- HAIR
- NAILS
- BREATH
- BLOOD
- SWEAT

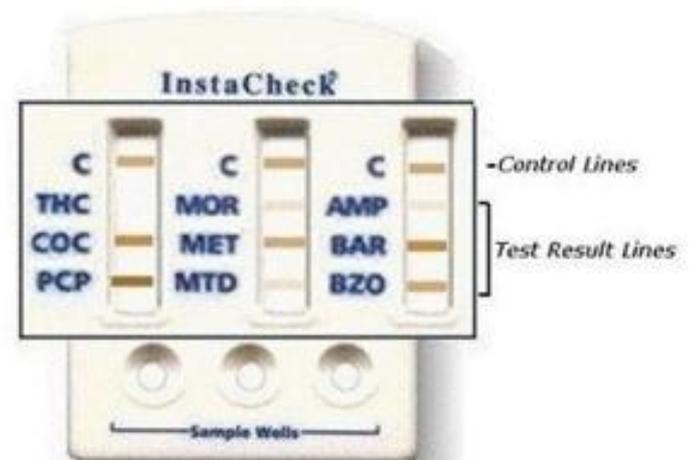
## Types of Tests

- POC TESTING: CUPS, STRIPS, AUTOMATIC STRIPS
- IMMUNOASSAY RUN IN LAB
- GAS CHROMATOGRAPHY/MASS SPECTROSCOPY

# WHY POC TESTING?

- FAST
- CHEAP
- PRESUMPTIVE
- QUALITATIVE AND NOT QUANTITATIVE
- HIGH FALSE POSITIVE
- HIGH FALSE NEGATIVE
- SUBJECT TO READING ERRORS

# Immunochromatography



*Negative Screen Result: Colored lines adjacent to each target drug name and in the control (C) regions will appear. The color intensity of the line for the target drug may be weaker or stronger than that of the control line however any line, no matter how faint should be interpreted as a negative result. Do not attempt to correlate the intensity or color of the test lines between the targeted drug panels.*

*Positive Screen Result: Colored lines appear in the control regions (C) but do not develop in the test region. The absence of any line in any target drug test region indicates a positive result for that drug or drug metabolite. In this example the screen is positive for THC and negative for all other targeted drugs. Note that test lines are not of equal intensity or color. Because of the various sensitivity cut-off levels for each specific drug this result is expected.*

*Note: In general, practically all drug tests using the lateral flow based immunoassay method and technology have the same result for positive and negative sample screens; the presence of a test line indicates a negative test while the absence of a test line indicates a positive test.*

# IMMUNOASSAY IN LAB – WHAT MOST MEDICAL OFFICES USE

- MORE ACCURATE
- MORE RELIABLE AND REPRODUCIBLE
- LONGER TURN-AROUND TIME
- PRESUMPTIVE AND UNEXPECTED RESULTS SHOULD BE CONFIRMED WITH GC/MS

# Instrumented IA (Lab)



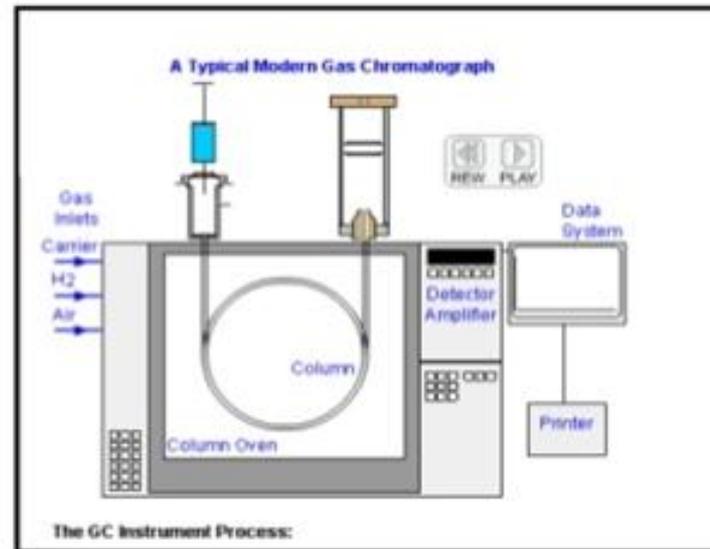
**ASAM** American Society of  
Addiction Medicine

# GC/MS

3

## GAS CHROMATOGRAPHY

- Gas chromatography leads to Separation of volatile organic compounds
- Separation occurs as a result of unique equilibrium established between the solutes and the stationary phase (the GC column)
- An inert carrier gas carries the solutes through the column



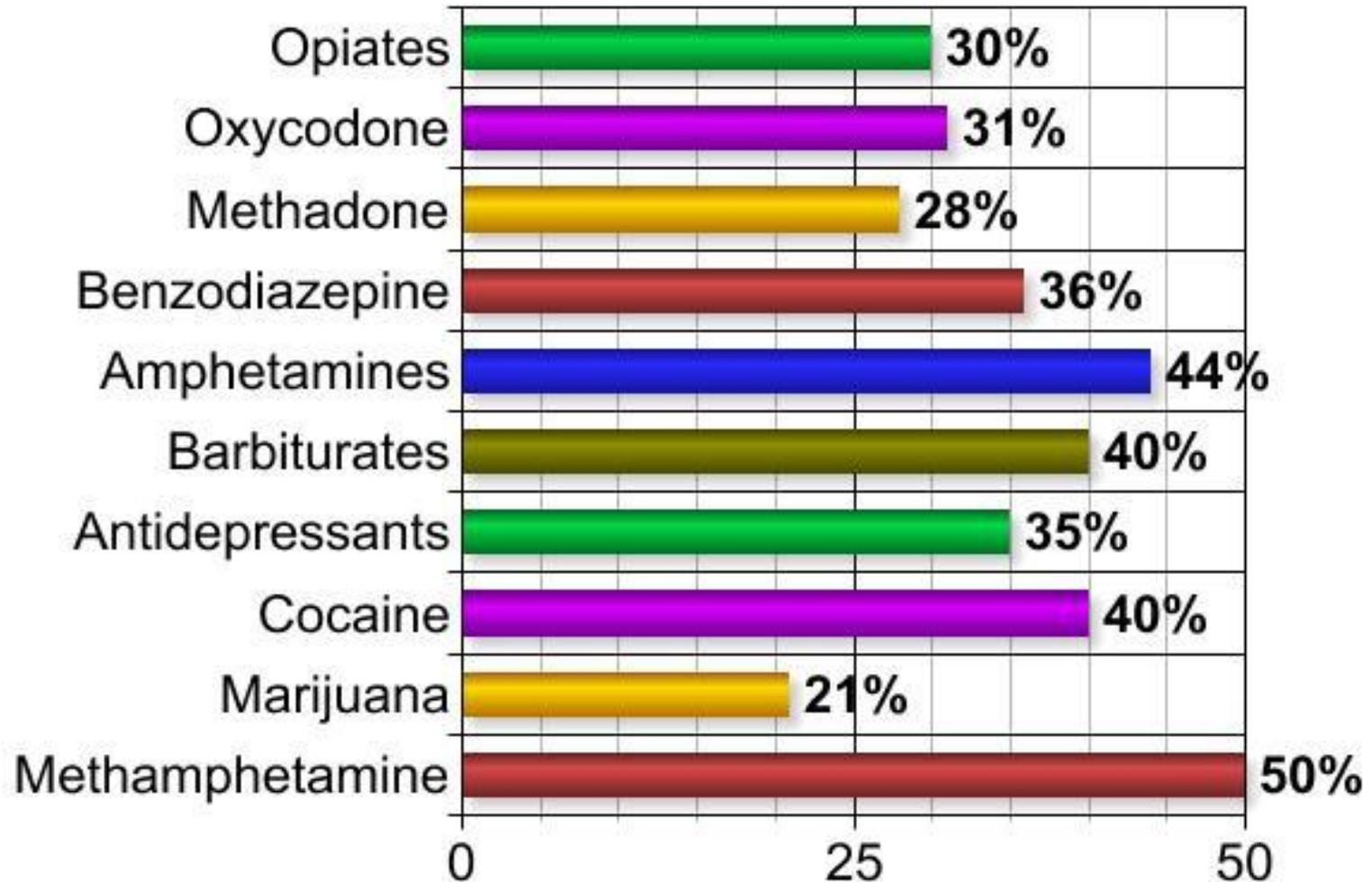
558

- DEFINITIVE
- QUANTITAVE
- LOW THRESHOLDS CAN BE MEASURED

# WHY POC TESTING?

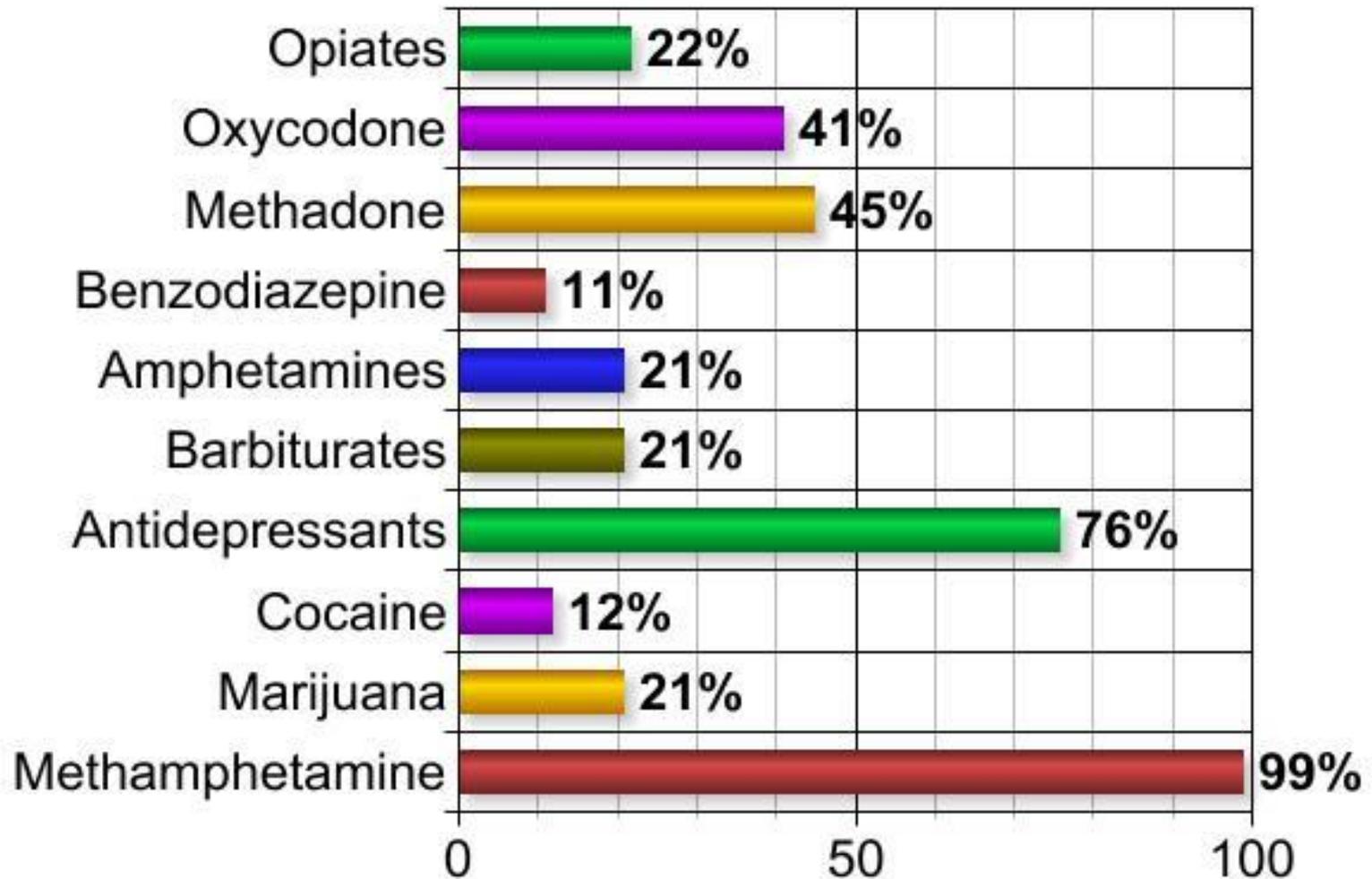
- FAST
- CHEAP
- PRESUMPTIVE
- QUALITATIVE AND NOT QUANTITATIVE
- HIGH FALSE POSITIVE
- HIGH FALSE NEGATIVE
- SUBJECT TO READING ERRORS

## False Negatives in Immunoassay POC Tests



Source: Millennium Health

## False Positives in Immunoassay POC Tests

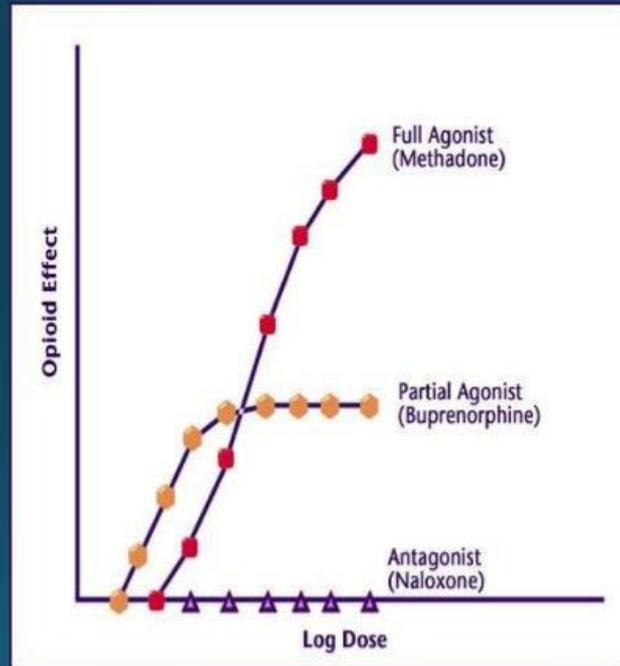


Source: Millennium Health

<https://www.ncbi.nlm.nih.gov/pubmed/25750166>

# Opioid Agonist Treatment

Methadone

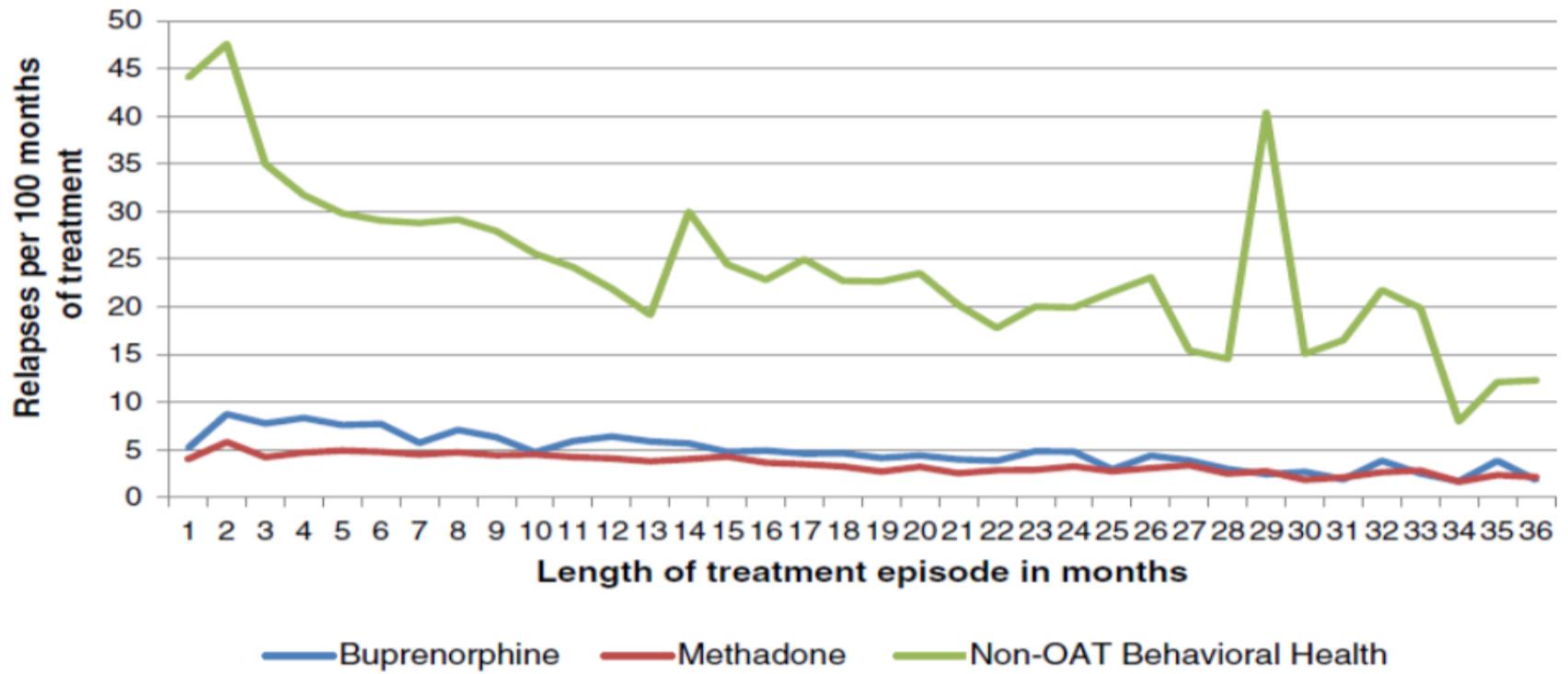


Buprenorphine



# What actually works?

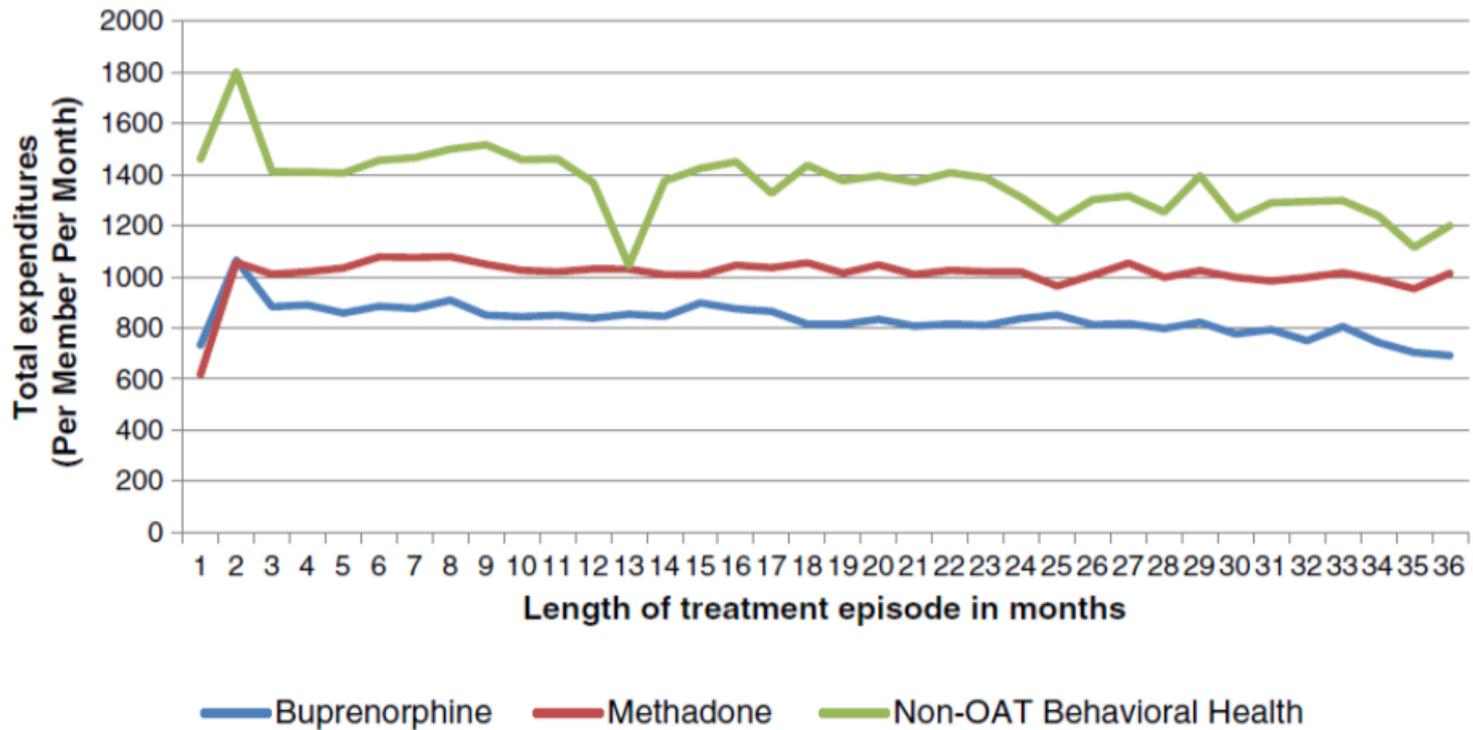
*R.E. Clark et al. / Journal of Substance Abuse Treatment xxx (2015) xxx-xxx*



# What are the costs?

(OAT = Opioid Agonist Treatment)

*R.E. Clark et al. / Journal of Substance Abuse Treatment xxx (2015) xxx-xxx*



# Which treatment is best?

## General guidelines

Methadone

Long history of use, high opioid tolerance, unstable life needing lots of structure and support

Buprenorphine

Mild-to-moderate dependence, greater life stability, more potential for abuse

Naltrexone

Mild-to-moderate dependence, greater life stability, greater risk of relapse and overdose

Tell Me About a Time When You Were  
in Sustained Recovery?

How long was it?

How did you feel?

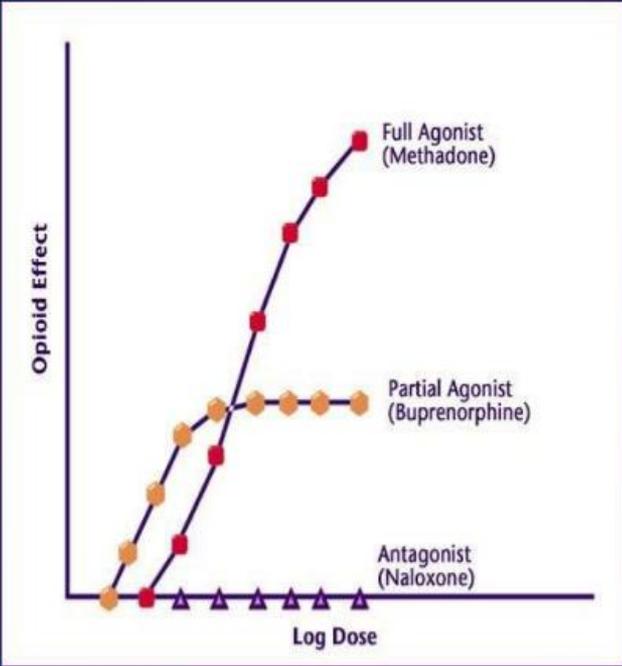
What helped you get there?

What disrupted it?

How do we get you back there again?

# Opioid Agonist Treatment

Methadone



Buprenorphine

