

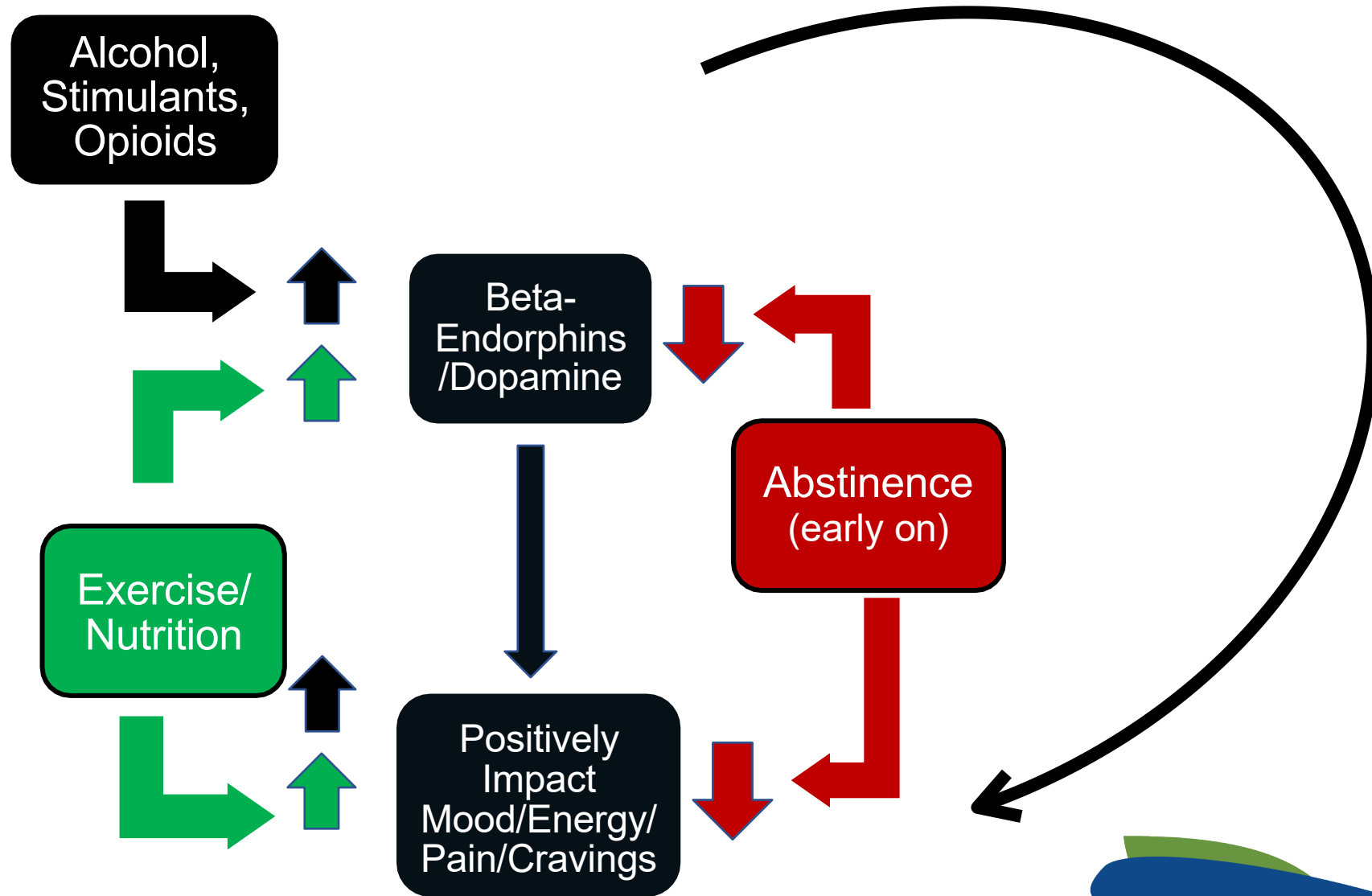
Nutrition, Recovery and Stigma:

*Willpower is not a
superpower*



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Adapted From National Institute of Drug Abuse



Post Acute Withdrawal Symptoms (PAWS)

POST-ACUTE WITHDRAWAL SYMPTOMS

Swings in mood

Anxiety

Energy variation

Irritability

Low level of enthusiasm

Concentration (variable)

Sleep disturbances

HEALTH INTERVENTIONS

Nutrient replacement

Physical activity

Energy

Increased metabolism

Promotion of well-being

Focus and concentration

Better Sleep

**Early
Intervention
Critical**

Melemis, 2015



Prevalence of Poor Diet

(A study of 67 patients admitted to a public hospital detoxification unit)

- Appetite and diet quality were poor overall
 - 88% requiring nutritional guidance
 - 50% were clinically deficient in minerals or vitamins (esp. vitamin A, iron, potassium, vitamin C, respectively)
- Prevalence of mild/moderate “malnutrition” was 24% ($p < 0.05$)

Ross, Wilson, Banks, Rezannah, Daglish, 2012



Nutritious foods can support recovery

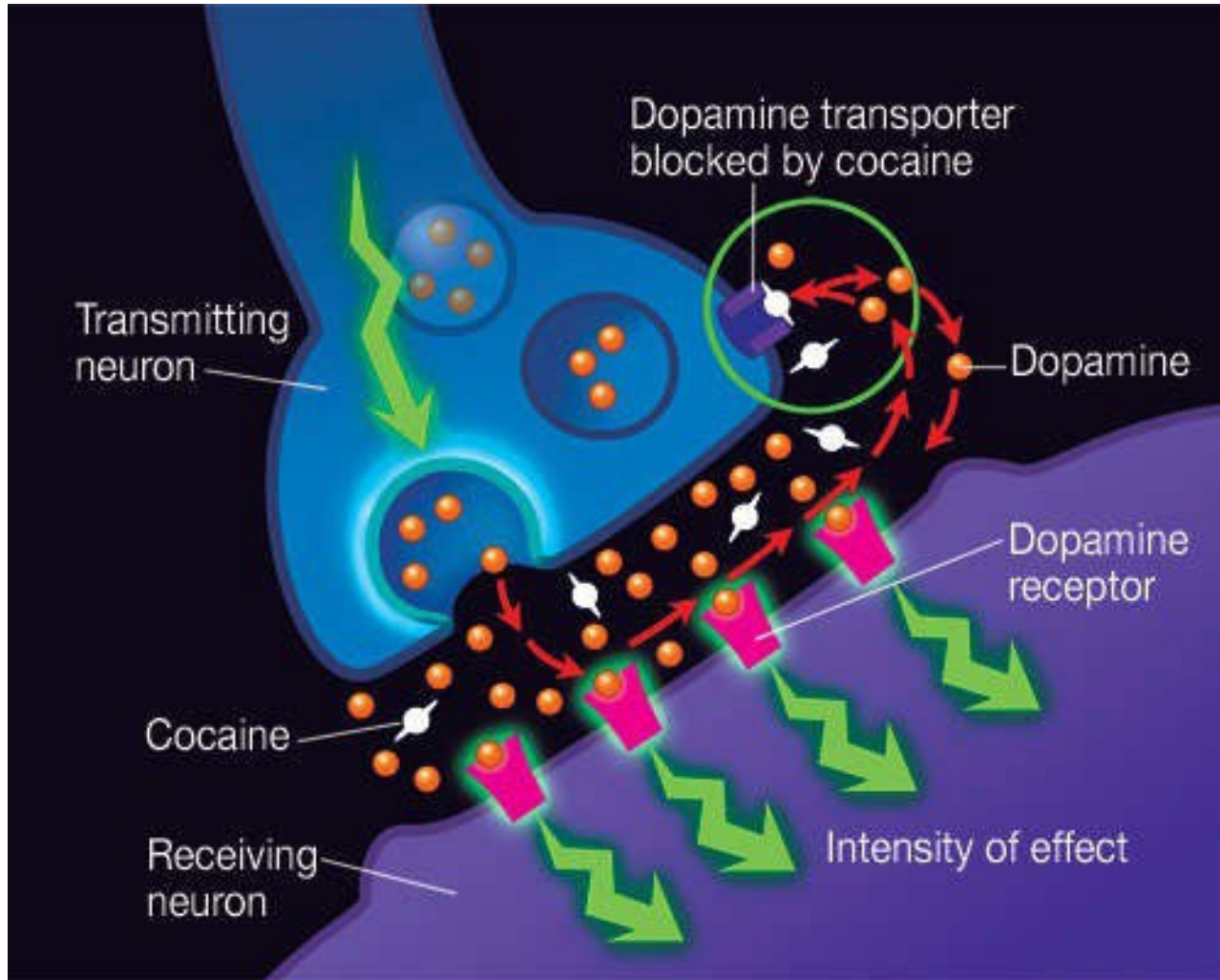
- Replace essential nutrients
- Provide adequate energy
- Stabilize mood
- Reduce and regulate cravings
- Bolster immune system
- Support physical healing processes
- Restore and regulate hormonal signaling
- Support treatment outcomes



Exercise Interventions

Dolezal et al., 2014	↑ EXERCISE VO ₂ max, strength; body mass, BF, BMI
Haglund et al., 2015 Rawson et al. 2015a Rawson et al., 2015b	↓ DEPRESSION ↓ DEPRESSION/ANXIETY ↓ METHAMPHETAMINE USE 1-, 3-, and 6-months post treatment
Robertson et al, 2016	↑ DOPAMINE striatal D2/D3 receptor availability
Salem et al, 2022	↓ CRAVINGS & METHAMPHETAMINE USE after discharge
Wang et al., 2015	↓ CRAVING during, immediately following, and 50 min after the exercise session
Wang et al., 2016	↑ INHIBITORY CONTROL
Wang et al., 2017	↓ CRAVING ↑ INHIBITORY CONTROL more accuracy
Zhu et al., 2016	↑ QUALITY OF LIFE (QOL) /BALANCE /BODY FAT
Xu et al., 2022	↑ QOL /MENTAL /PHYSICAL FITNESS social, mental and physical health
Zhang et al., 2018	↑ PROCESSING SPEED

Mechanism of Action



SURGE - Methamphetamine increases release of dopamine leaving the presynaptic cell

TRAP – Cocaine and methamphetamine block the re-entry back into presynaptic cell

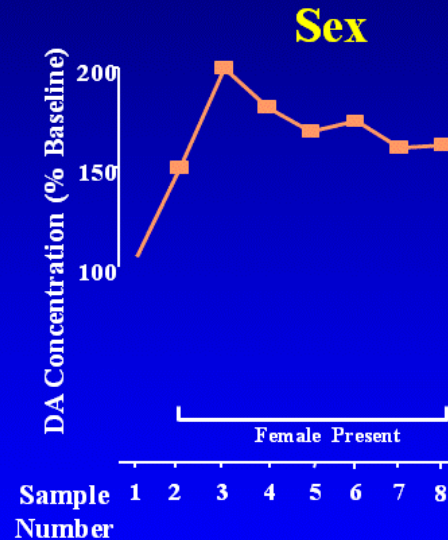
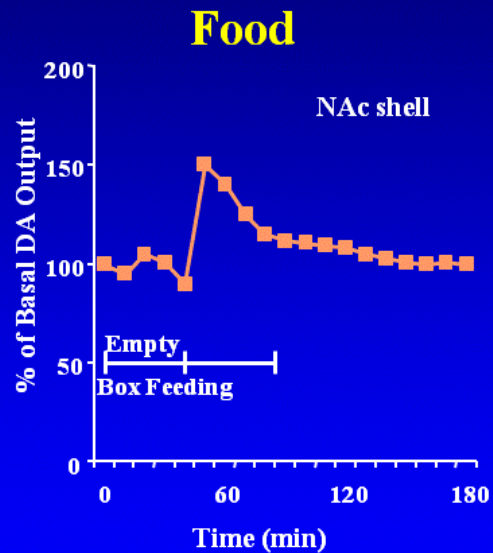
Photo from National Institute of Drug Abuse

<https://www.drugabuse.gov/publications/research-reports/cocaine/how-does-cocaine-produce-its-effects>

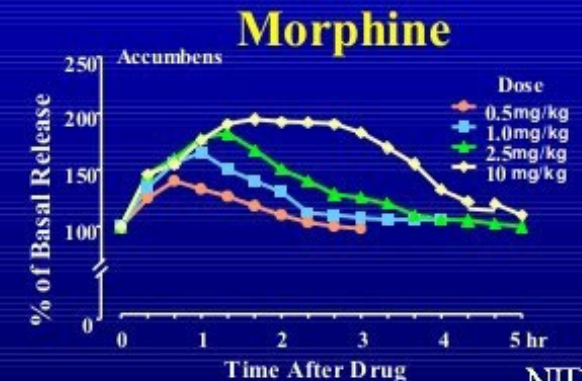
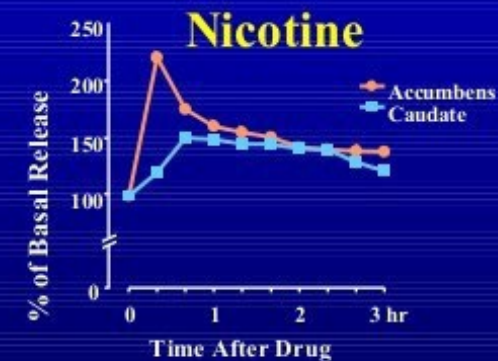
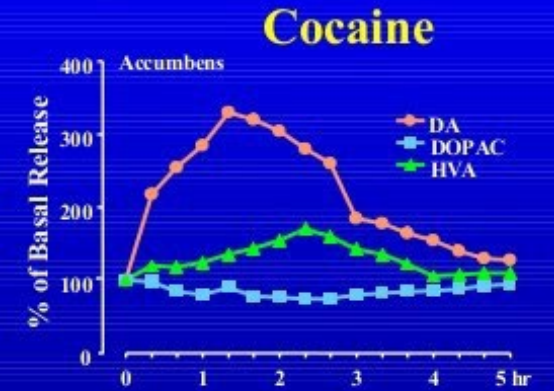
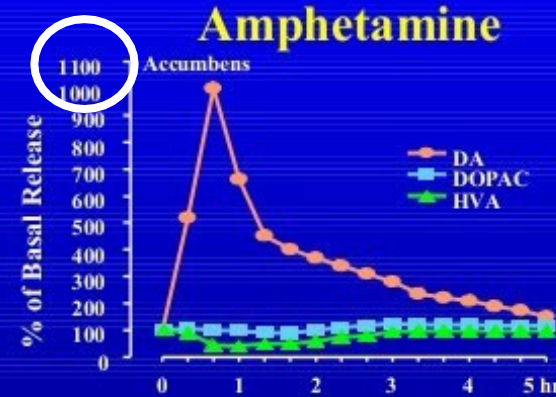


Dopamine levels

Natural Rewards Elevate Dopamine Levels



Effects of Drugs on Dopamine Release



Di Chiara et al., Neuroscience, 1999., Fiorino and Phillips, J. Neuroscience, 1997.

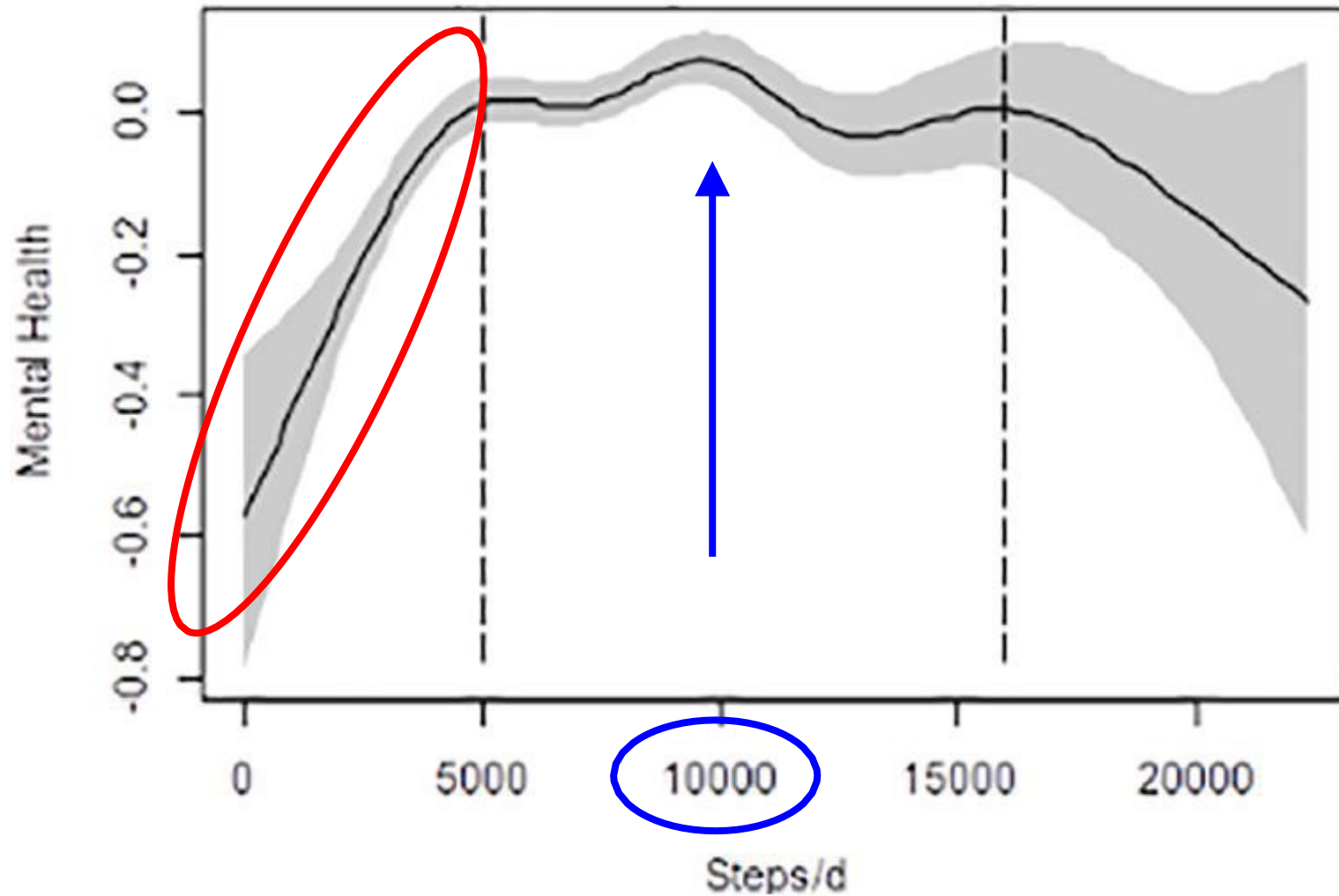
NIDA

Di Chiara and Imperato, PNAS, 1988

NIDA

National Institute of Drug Abuse

Mental Health and Steps



**Dose-Response
Exercise for
Mental Health**

Bernard et al, 2018



Exercise Interventions and Methamphetamine Use Disorder

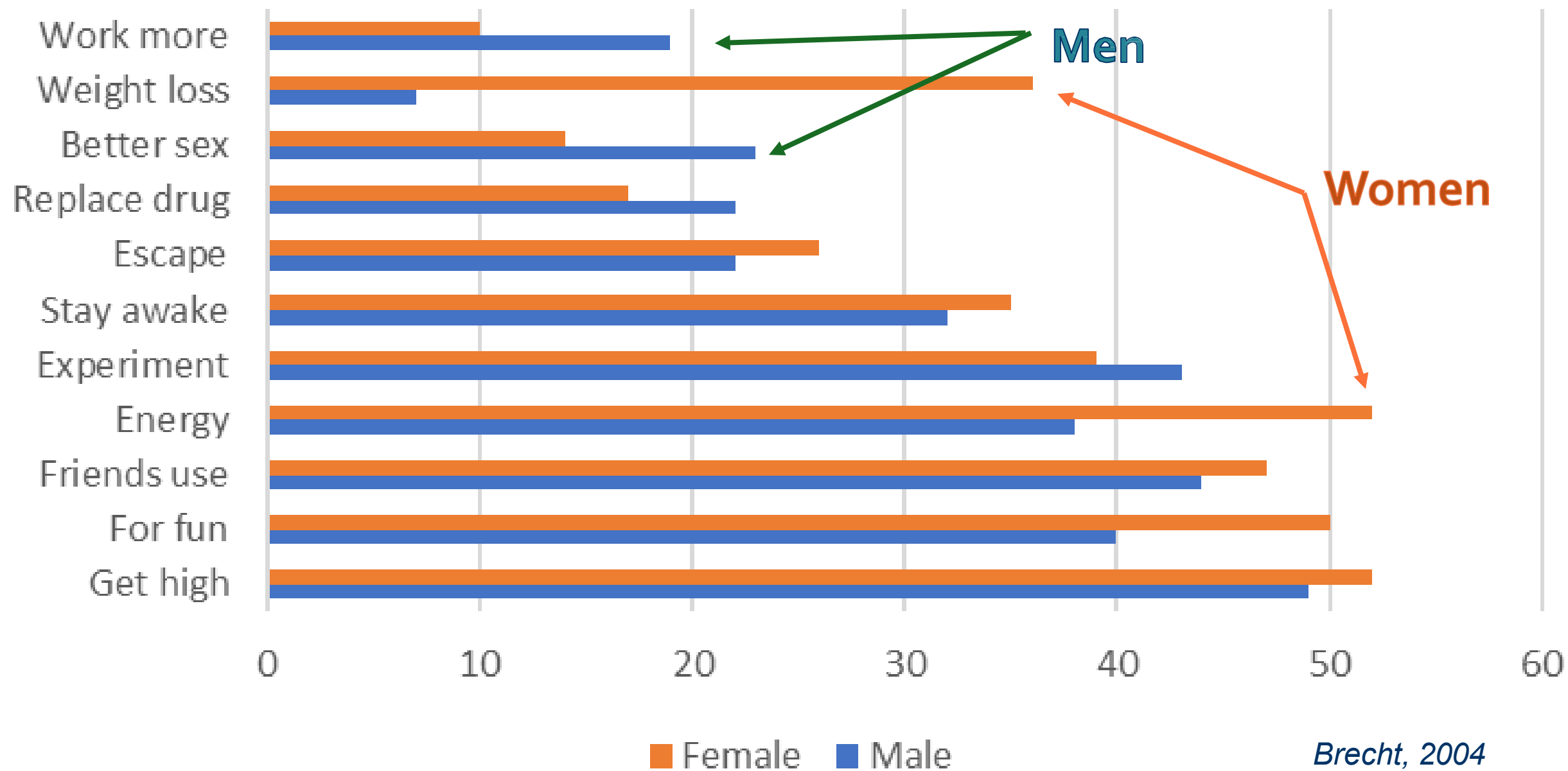
Citation	Sample	Ex Type/Dose	Outcomes
Dolezal et al., 2014	50 M (100%) , 22 controls, 28 abstinent MA-dependent (14 Ex + 14 no Ex)	Endurance + resist tng (ea 30m) 3 d/wk, 8 wks	↑ EXERCISE VO ₂ max, strength; body mass, BF, BMI
Haglund et al., 2015 Rawson et al. 2015a Rawson et al., 2015b	135 M (70%) , MA-dependent (69 Ex + 66 health education)	Endurance (30m)+resistance (15m) 3 d/wk, 8 wks	↓ DEPRESSION , ↓ DEPRESSION/ANXIETY ↓ MA USE 1-, 3-, and 6-months post treatment
Robertson et al, 2016	19 M (53%) MA-dependent (10 Ex + 9 health education)	Endurance (30m)+resistance (15m) 3 d/wk, 8 wks	↑ DOPAMINE striatal D2/D3 receptor availability
Salem et al, 2022	138 M (80%) MUD (71 Ex + 67 HE)	Endurance + resistance (60m) 3 d/wk, 8 wks	↓ CRAVINGS & MA USE after discharge
Wang et al., 2015	24 M (83%) MA dependent (Ex + reading controls)	Endurance (20m)	↓ CRAVING during, immediately following, and 50 min after the exercise session
Wang et al., 2016	92 M (87%) MA dependent (Ex + reading controls)	Endurance (20 m)	↑ INHIBITORY CONTROL (IC)
Wang et al., 2017	50 M (78%) MA dependent (Ex + control group)	3 d/wk, 12 wk	↓ CRAVING / ↑ IC more accuracy
Xu et al., 2022	60 M (100%) MA dependent (30 Ex + 30 non-Ex)	Endurance (30 m) + stretching (20m) 5 d/wk, 12 wk	↑ QOL/MENTAL/PHYSICAL FITNESS social, mental and physical health
Zhu et al., 2016	60 M (100%) (30 Tai Chi + 30 standard care group)	Tai Chi intervention (30 m) 5 d/wk, 12 wk	↑ QOL/BALANCE/BODY FAT
Zhang et al., 2018	103 M (77%) 68 MA-dependent (34 Ex, 34 non-Ex, 35 healthy controls)	Endurance (30 m) 3 d/wk, 12 wk	↑ PROCESSING SPEED

Women & Substance Use

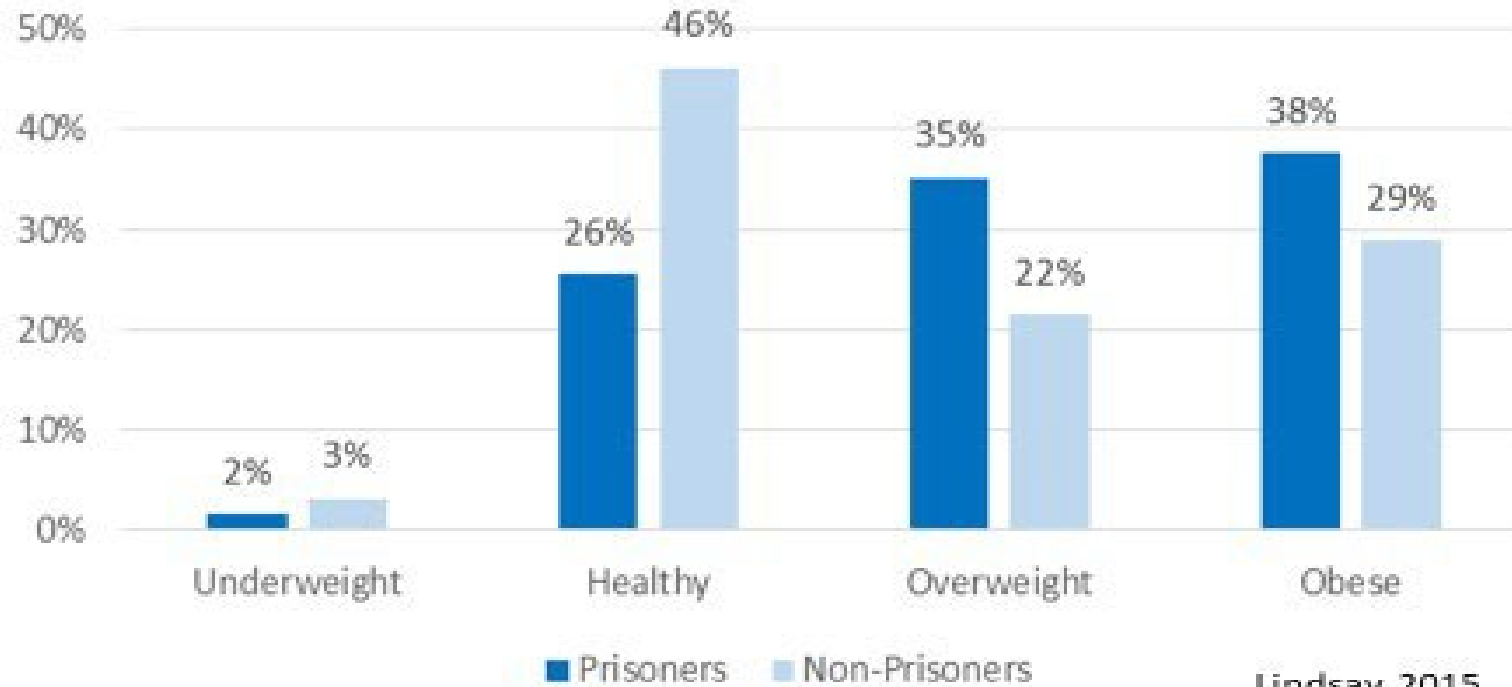
- Women *use different drugs* than men
- Females *respond to drugs differently* than males
- Women *use drugs for different reasons* than men
- Women *relapse for different reasons* than men



Motivators for Methamphetamine Use



BMI Categories (CDC)



Lindsay, 2015

Study: (2015)
125
Adult Women
Nevada Prison



Weight-Related Concerns

*Women in treatment for SUD's
Nevada; n = 297)*

33% Started using drugs (in part) to lose weight

71% Concerned about weight gain in recovery

45% Concerned that gaining weight could trigger relapse

Warren, Lindsay, et al 2012



Stimulants and Co-Occurring Disorders (Recent)

Citation	Sample	Outcomes
Liu Lie, et al, 2022	29 Chinese, adult females using drugs	48% used drugs for WEIGHT with 50% using methamphetamine, 50% polysubstance
Bruening et al, 2018	131 U.S., non-clinical sample of college age females using drugs	15.3% used drugs for WEIGHT with 70% using methamphetamine
Perniciaro et al, 2024	1,656 middle school females from 2019 U.S. YRBS	BODY DISSATISFACTION was a significant predictor for SU ($p<.01$) and suicidality ($p<.001$); 57% were trying to lose weight
Skot et al, 2022	20,759 eating disorder patients from a registry of Denmark residents	Patients with EATING DISORDERS (and no prior illicit SUD diagnosis) exhibited an increased relative risk of a subsequent diagnosis of any illicit SUD compared with respective controls
Qeadan et al, 2023	414,299 students from National College Health Assessment survey	Students with EATING DISORDER indications were significantly more likely to report substance use outcomes, including SUD diagnosis (Adjusted Odds Ratio 7.43)
Ganson, et al 2021	28,608 U.S., adult females from the Healthy Minds Study	Positive EATING DISORDER screen most strongly associated with methamphetamine use (Adjusted Odds Ratio 3.93)

MEN

Urban men interviewed at different stages of recovery

Themes identified included excess weight gain, meaningful use of food, and disordered eating

Men in early recovery described dysfunctional eating practices

Those in mid to later recovery expressed distress about efforts to lose weight

Cowan et al, 2008



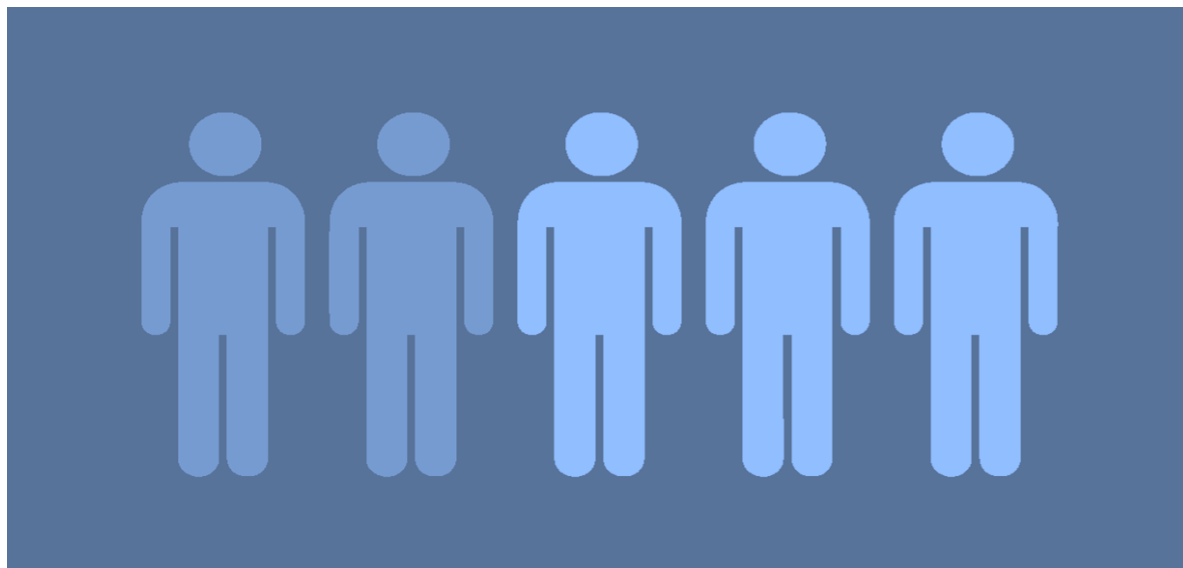
So, what is the solution?
How do we fix this problem?

<https://www.youtube.com/watch?v=uK7M7GwC3jA>



Stigma is
branded on you
without your
permission





42% of U.S. adults across all body sizes
report experiencing weight stigma at
some point in their life

Lee et al, 2021



Discrimination is
a legal matter

Stigma is
a social disease



“I don't eat right”
does NOT mean
“I don't care about my health”

“I don't exercise”
does NOT mean
“I'm lazy!”



Why Weight Gain During Recovery

Lifestyle related: Changes in eating and activity can lead to weight gain

Psychological factors: Coping with cravings or withdrawal symptoms can lead to weight gain

Underlying physiological/metabolic changes: SUDs disrupt the body's metabolism causing weight gain during recovery

Chronic Pain: Opioids, often used for pain, increase pain during abstinence

Treatment-related : Medications used to treat SUDs can cause weight gain



Weight Stigma Impact on MH and SUD:

- ↑ Cortisol levels (a condition linked to fat deposition and numerous chronic health problems) *Tomiyama, 2014*
- ↑ Risk for mental health problems (depression, anxiety, substance use, and suicidality) as people internalize sizeist attitudes and begin to self-stigmatize
- ↓ Cognitive performance; participants anticipate facing weight stigma *Hunger, 2018*
- ↓ Sleep *Birtel, 2017*
- ↑ Feelings of shame, low self-esteem leading to relapse to try to avoid or escape further stigma
- ↓ Likelihood to seek health care and adhere to treatment recommendations further hindering their recovery



Higher BMI predicts:

Stress ($p=0.001$)

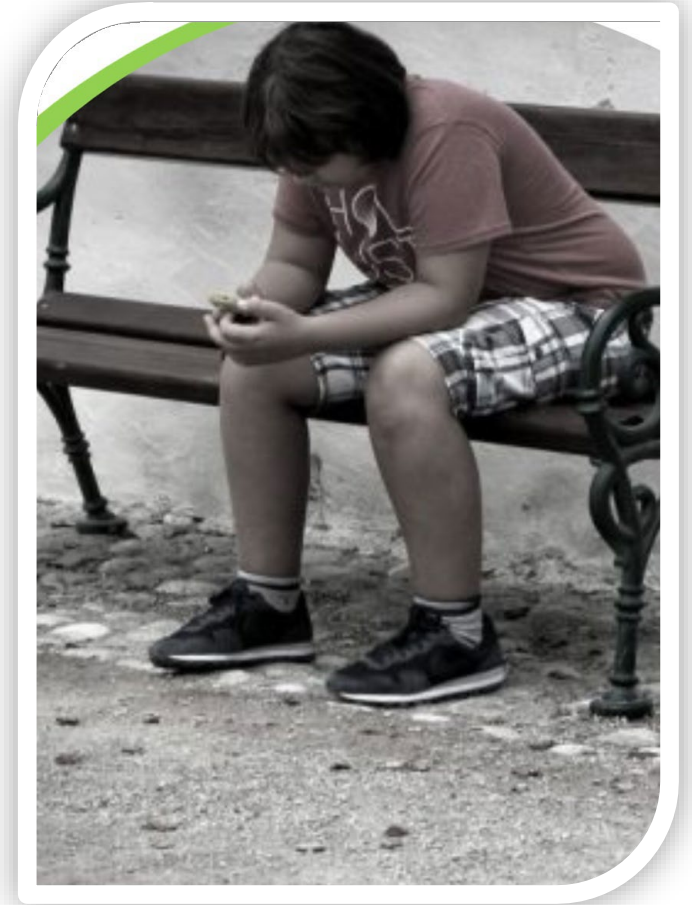
Anxiety ($p=0.001$)

Depression ($p=0.002$)

(Cabral, 2024)

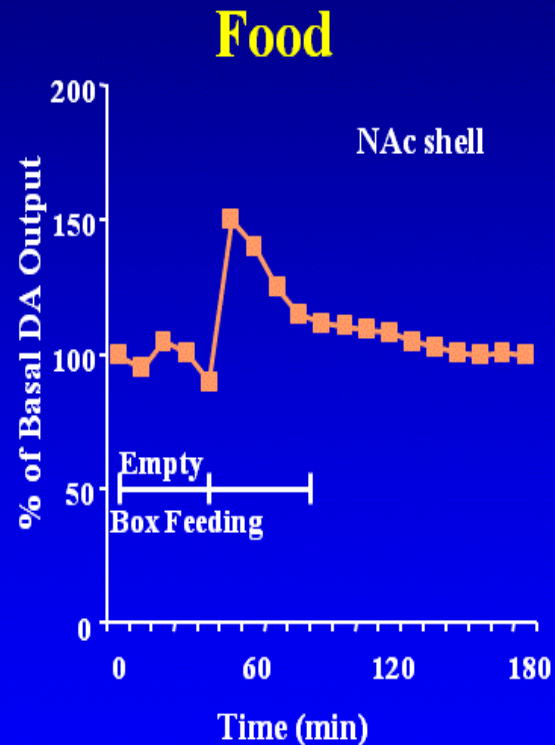
Decrease Inhibitory Control

(Tavares, 2021)

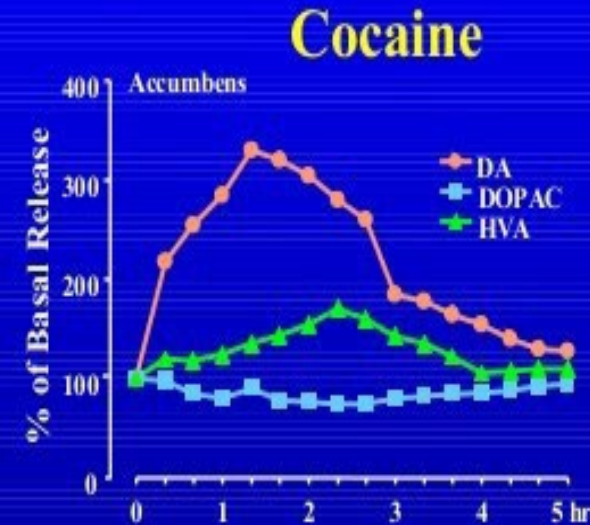
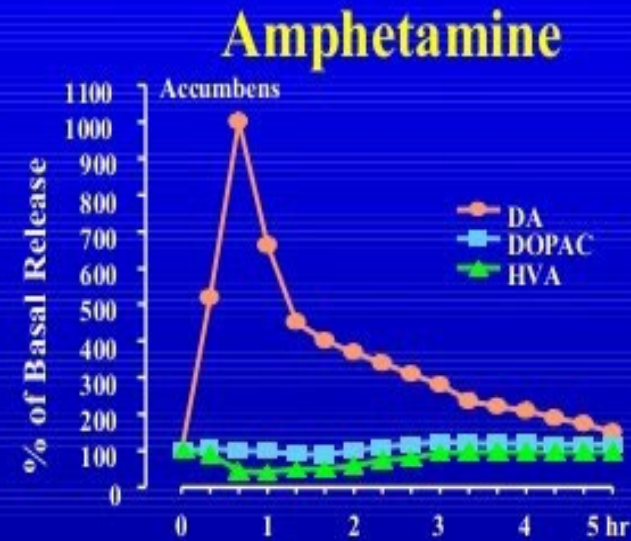


Natural Rewards Elevate Dopamine Levels

National Institute of Drug Abuse



Effects of Drugs on Dopamine Release



High Comorbidity Between SUD's and Disordered E



Weight gain, usually from

- Trigger body
- Lead
- Disordered
- igma
- some individuals

Re...ecting or overemphasis on weight
con... during recovery can be a
relapse risk factor or trigger
disordered eating behaviors

**Underdiagnosed in
higher weight individuals**



Adolescents who experience weight stigma often engage in laxative use or self-induced vomiting to control or reduce weight

These have been linked to increased risk of substance use, including alcohol, cigarettes, or marijuana

Simone, 2019



	2012 <u>Tx Center</u>	2015 <u>Prison Study</u>
<i>Diet pills</i>	38% (110)	(36%)
<i>Smoking</i>	30% (87)	(44%)
<i>Starvation</i>	26% (74)	(30%)
<i>Energy drink</i>	23% (66)	(49%)
<i>Energy suppl</i>	22% (65)	(42%)
<i>Vomiting</i>	14% (39)	(14%)
<i>Laxatives</i>	8% (23)	(14%)
<i>Enema</i>	4% (10)	(5%)
<i>Methamphetamine</i>		(51%)



Methods Used for Weight Loss

Warren et al, 2012; Lindsay, 2015



Study: Girls (n-1,147) who used unhealthy weight-control behaviors and experienced the harms of weight stigma during adolescence were likely to use substances as adults

3 groups based on self-reported weight stigma experiences:

1. No weight stigma
2. Weight stigma (teased by peers/parents w no sense of harm)
3. Weight stigma w perceived harms (bothered by teasing)

- Were likely to use substances in adulthood
- The more unhealthy weight-control behaviors they practiced in adolescence, the more they used substances in adulthood

Simone, 2019



So now...

So, now what?



Starts with me...

1. Ask yourself if the size of someone else's body matters to you
2. Be aware of the influence weight stigma might have on another individual.
3. Challenge others to recognize stigmatizing thoughts
4. Share knowledge of the health effects of weight stigma with others.
5. Explain how you are overcoming your own issues with weight bias

Simone, 2019



And then us (clinical)...

Employ better health initiatives that focus on reducing weight stigma and its associated harms to prevent substance use

Assess for experiences of weight stigma and its harms with individuals with unhealthy weight control behaviors

Create supportive environments by developing treatment and support systems that are inclusive and affirming of all body sizes

Address medical bias such as training healthcare providers about weight bias and its impact on client care to help them provide supportive and effective treatment.



And then us (non-clinical)...

Honor body diversity

Acknowledge the emotional impact of weight gain and empower individuals to develop a positive body image and address negative self-talk

Include body image and weight stigma topics in group sessions

Encourage peer groups to use inclusive, non-judgmental language around food and body image

Include weight-neutral health approaches





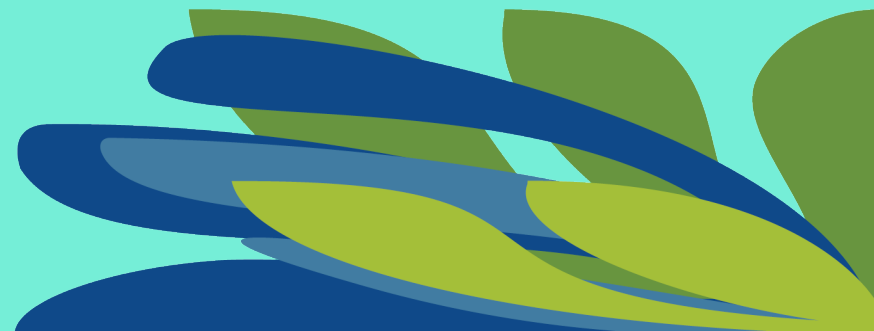
LANGUAGE

Weight-neutral not Weight-centric

Minimize “weight talk” and
change the way we think
and talk about food



CALORIE



*“Calorie” - the amount of heat
needed to raise the temperature
of 1 gram of water by 1°C*

We don't need to talk about calories!



Mac N Cheese Nutrition Facts	
3 Servings per Container Serving Size 2.5 oz (about 1 cup)	
Amount per serving	
Calories	400
	% Daily Value*
Total Fat 20g	28%
Saturated Fat 5g	21%
Trans Fat 0g	
Cholesterol 7mg	2%
Sodium 402 mg	17%
Total Carbohydrate 51g	39%
Dietary Fiber 2g	9%
Total Sugars 8g	16%
Includes 0g Added Sugars	0%
Protein 11g	
Vitamin D 0µg	3%
Calcium 126mg	20%
Iron 1 mg	8%
Potassium 108 mg	2%
*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	
ENRICHED MACARONI PRODUCT (WHEAT FLOUR, NIACIN, FERROUS SULFATE (IRON), THIAMIN MONONITRATE [VITAMIN B1], RIBOFLAVIN [VITAMIN B2], FOLIC ACID); CHEESE SAUCE MIX (WHEY, MILKFAT, MILK PROTEIN CONCENTRATE, SALT, SODIUM TRIPOLYPHOSPHATE, CONTAINS LESS THAN 2% OF CITRIC ACID, LACTIC ACID, SODIUM PHOSPHATE, CALCIUM PHOSPHATE, YELLOW 5, YELLOW 6, CHEESE CULTURE ENZYMES) CONTAINS: WHEAT, MILK	

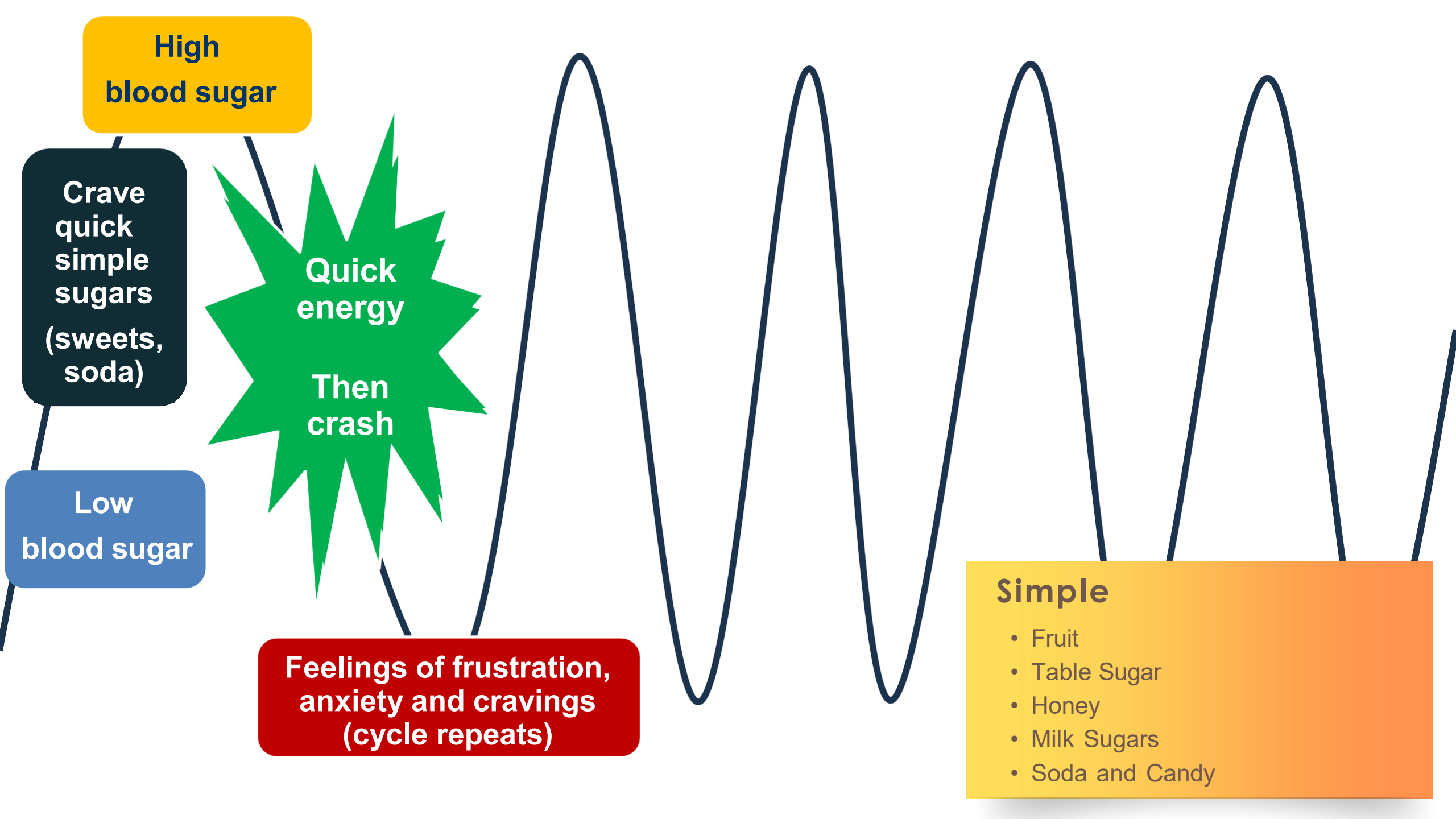
Nutrients you want LESS of

< 5%

Using the Quick
● Guide to Percent
Daily Value

Nutrients you want MORE of

>20%



blood sugar more stable

blood sugar more stable

Complex Carbs (whole grains, fiber, fruits and vegetables)

Complex

- Breads, rolls
- Cereal
- Oatmeal
- Popcorn
- Tortillas
- Crackers
- Pasta
- Whole fruits and vegetables



Eat any time
(higher nutrient quality)

Eat sometimes
(fall somewhere in between)

Eat once in a while
(lower nutrient quality)

Public Health Messaging

Puhl and her colleagues found that when messages focus on health behaviors—such as replacing sugary drinks with water or improving fruit and vegetable consumption—without mentioning weight or obesity, participants report higher motivation and intent to change their behavior

Puhl, 2012



Thank you!

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