

Eating Disorders

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“My War With Food Addiction”

- “Some people fight battles with guns and tanks, others use spoons and kitchen utensils. I remember the Battle of the Bulge. The *Ponderosa Salad Bar* suffered a six-plate defeat. I remember a war with a chocolate Easter bunny. In the middle of the night, I bit its head off. I admit it. I was a food addict. My life was controlled by food. Moderation was never my strong point.

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“My War With Food Addiction”

- When it came to ice cream, one scoop was never enough. I once ate a two-and-a-half gallon tub of maple walnut ice cream. It almost froze my stomach. To make matters worse, it was my roommate’s ice cream! I felt so badly afterwards that I put a 12-foot chain through the handles of the refrigerator and cupboards and told my roommate, “*here’s the key to your food.*” He wasn’t impressed.”
 - Tom McGregor, “*Eating in Freedom*”

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Step Two: Overeater’s Anonymous

- “We have driven miles in the dead of night to satisfy a craving for food. We have eaten food that was frozen, burnt, stale, or even dangerously spoiled. We have eaten food off of other people’s plates, off the floor, off the ground. We have dug food out of the garbage and eaten it.”

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Step Two: Overeater’s Anonymous

- “We have frequently lied about what we have eaten-lied to others because we didn’t want to face the truth ourselves. We have stolen food from our friends, ...we have also stolen money to buy food. We have eaten beyond the point of being full, beyond the point of being sick of eating. We have continued to overeat, knowing all the while we were disfiguring and maiming our bodies.”

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Anorexia

- “I don’t see what they tell me they see in the mirror. My cheeks are too full, my hips and thighs are too wide and round, my arms carry too much fat and my stomach bulges. Looking in the mirror is a daily torture that I allow myself, because who can resist the temptation of that reflective sheet of glass? Of glimpsing who they think they are?”

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Anorexia

- I am afraid. Someone please tell me there is a better way, because I just don't know where to turn or what to do. I am fifteen, and I will join the ranks of those who call themselves anorexic."

-Anonymous

Tonight's talk

- What is an eating disorder?
- Are eating disorders addictions?
- What is addiction?
- What parts of the brain are involved?
- What is obesity?
- What are the consequences of eating disorders?
- How are eating disorders treated? What about medication?
- Brain scans: the lights are bright, but nobody's home.....
- Where can I get help?

".....he's very depressing" (2007)

"I left tonight entirely without hope" (2011)

Eating Disorders ≠ weight disorder

- Anorexia Nervosa
- Bulimia
- Binge eating disorder

Anorexia Nervosa

- Refuses to maintain a "normal" weight or >15% below IBW
- Fear of weight gain
- Severe body image disturbance
- Absence of menstrual cycles (if post-menstrual female)
- 2 types: restrictive and binge/purging*

Bulimia Nervosa

- Episodes of binge eating with a sense of loss of control
- followed by compensatory behavior of the purging type (self-induced vomiting, laxative abuse, diuretic abuse) or nonpurging type (excessive exercise, fasting, or strict diets).
- Binges and the resulting compensatory behavior must occur a minimum of two times per week for three months
- Dissatisfaction with body shape and weight

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Binge Eating Disorder

- Eating much more rapidly than normal
- Eating until uncomfortably full
- Eating large amounts of food when not feeling physically hungry
- Eating alone because of embarrassment
- Feeling disgusted, depressed, or very guilty after overeating

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Eating Disorders: are they Addictions?

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What is Addiction?

- Physiologic Dependence?
- Lack of willpower?
- An “amoral” condition?
- A brain disease?

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Physiologic Dependence: Tolerance and Withdrawal

- Tolerance: requiring increasing amounts of drug to get the same effect
- Withdrawal: the opposite effect of the drug when it is removed
- NEITHER of these imply chemical dependency (addiction)

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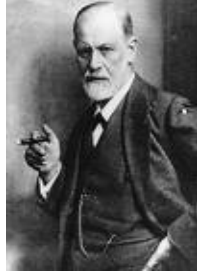
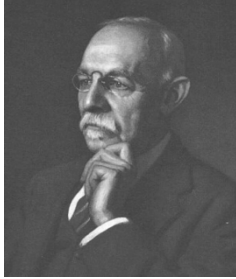
Lack of Willpower?



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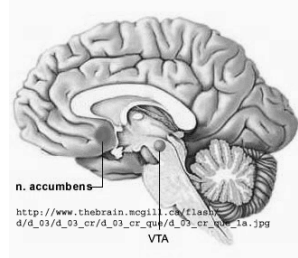
An “amoral” condition?



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A Brain Disease?

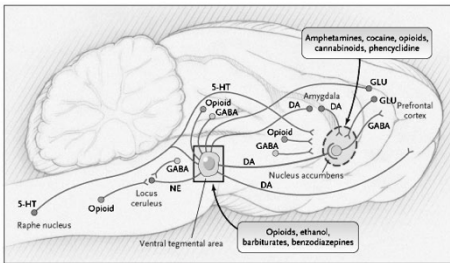


n. accumbens
http://www.thebrain.mcgill.ca/flash/d/d_03/d_03_cr/d_03_cr_q4/d_03_cr_q4_1a.jpg
 VTA

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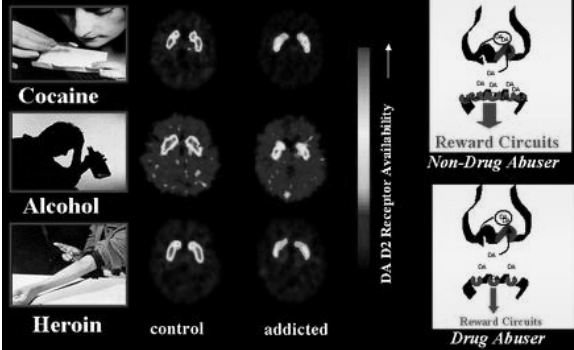
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VTA: supplies DA to the N Acc
 The NA: GO!!!
 Frontal Cortex: STOP!!!!



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Dopamine D2 Receptors are Lower in Addiction



“I feel like I don’t belong in my own skin....”
 anonymous alcoholic

- Decreased Dopamine receptors = decreased Dopamine =
- **Decreased Hedonic Tone**

□ **Salsitz 2006**

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Can you find the (alleged) future alcoholic?



Chemical Dependence: DSM IV definition

- Tolerance
- Withdrawal
- Take more/take longer than intended
- Can't cut down or control use
- Great deal of time spent in obtaining/using /recovering
- Important social/occ/recreation given up 2° to use
- Use despite physical/psych problem

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Addiction/chemical dependence: working definition

- A chronic progressive disease characterized by the following physical and psychological symptoms (the four (five) C's):
- **Craving**
- **Compulsion**
- **Loss of Control**
- **Continued** use despite consequences, and
- **Chronic** use

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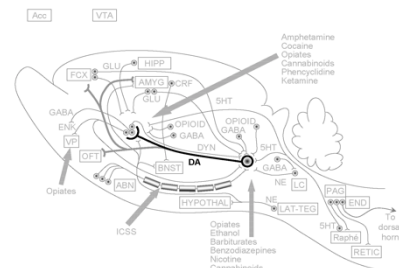
RELAPSE: the problem with addiction

- Drug triggered: "I thought I could (eat/smoke/drink) just one...."
- Stress triggered: "I'm going through too much right now. Gimme that!"
- Cue triggered: "Wet faces and wet places"

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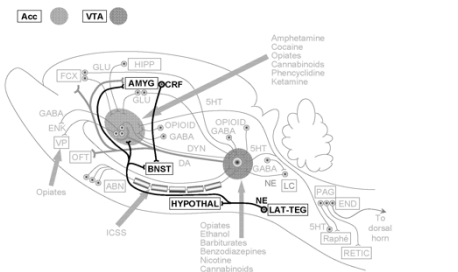
Drug Triggered Relapse: Gardner 2006



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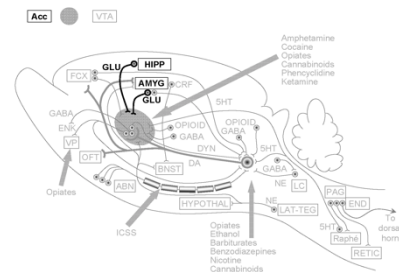
Stress Triggered Relapse: Gardner 2006



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Cue Triggered Relapse: Gardner 2006



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Other parts of the Brain

- Dorsal Striatum (Craving)
- Amygdala (Memory/Danger/emergency)
- Hippocampus (memory)
- Frontal cortex (? Inhibition)
- Hypothalamus (Appetite/satiety)

Other Neurochemicals in the Brain

- Norepinephrine (stimulates/satiates)
- Serotonin (calms)
- Endocannabinoids (super size that, please!)
- Endorphins (increased feeding)
- Leptin (antagonist of EC)
- Ghrelin (stimulates appetite)

FA/OA

- “We ask that during your share you not mention specific food groups by name”

AA/NA

- “Don’t let yourself become Hungry, Angry, Lonely, or Tired!”

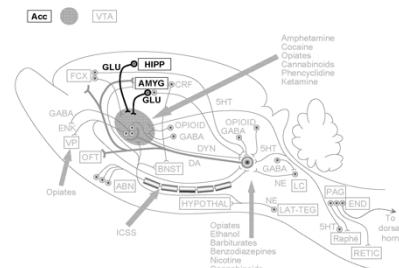
“Hi...I’m Joe. I’m cross addicted”

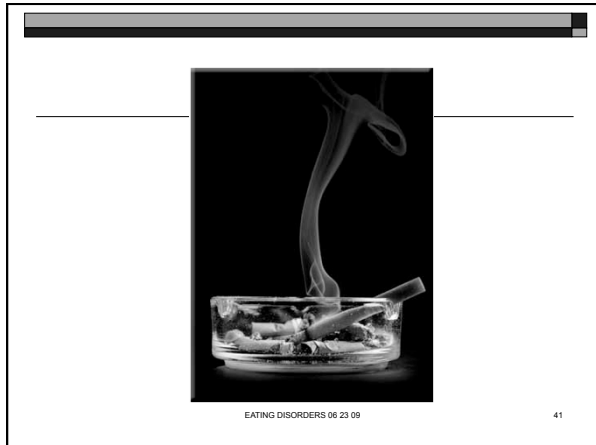
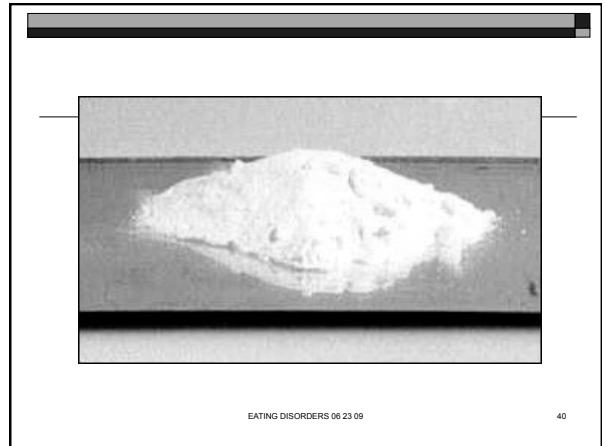


Food Addiction????

- FA: “Hi, I’m Joe. I’m a food addict”.
- OA: “Hi, I’m Joe. I’m a compulsive overeater.”
- Both are describing the same thing: an abnormal relationship with food.

Cue Triggered Relapse: Gardner 2006





Are Eating Disorders Addictions?

Mark Gold, "Eating Disorders, Overeating, and Pathological Attachment to Food".

- "The 1960s were known as the decade of sex, drugs, and rock and roll. Food seems to be an afterthought and it may be that it is suppressed by drug-taking.
- ...the heavier the patient, the less alcohol and illegal drugs they use. It is almost as if they are competing for the same reward sites in the brain.
- Treatment of addicts appears to result in weight gain....all supervised drug abstinence treatment causes weight gain.
- ...loss of control over eating and obesity produces changes in the brain, which are similar to those produced by drugs of abuse."

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Are Eating Disorders Addictions? Nora Volkow

- Many obesity researchers focus on how the body's fuel and fat levels control appetite. But as binge eaters know, habits and desire often override metabolic need, which share some of the characteristics of drug using behavior in drug-addicted subjects.

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Obesity: use despite consequences

- How do you define it?
- How has it changed in the U.S.?
- What are the known causes ASSOCIATIONS not causes)?

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BMI Graph

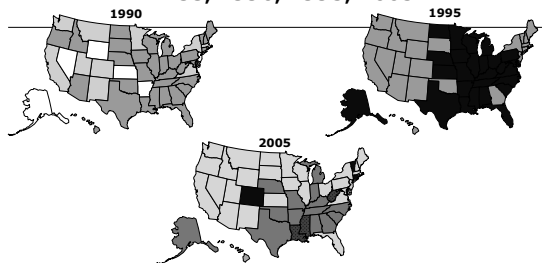
Under weight (BMI less than 18) Healthy weight (BMI between 18 and 24.9)
Overweight (BMI between 25 and 29.9) Obese (BMI between 30 and 34.9)
Severely Obese (BMI between 35 and above)

	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330
5'0"	20	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65
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5'4"	17	19	21	22	24	26	28	29	31	33	34	36	38	40	41	43	45	46	48	50	52	53	55	57
5'5"	17	18	20	22	23	25	27	28	30	32	33	35	37	38	40	42	43	45	47	48	50	52	53	55
5'6"	16	18	19	21	23	24	26	27	29	31	32	34	36	37	39	40	42	44	45	47	49	50	52	53
5'7"	16	17	19	20	22	24	25	27	29	30	31	33	35	36	38	39	41	42	44	46	47	49	50	52
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5'10"	14	16	17	19	20	22	23	24	26	27	29	30	32	33	35	36	37	39	40	42	43	45	46	47
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6'2"	13	14	15	17	18	19	21	22	23	24	25	27	28	30	31	32	33	35	36	37	39	40	41	42
6'3"	13	14	15	16	18	19	20	21	23	24	25	26	28	29	30	31	33	34	35	36	38	39	40	41
6'4"	12	13	15	16	17	18	20	21	22	23	24	25	27	28	29	30	32	33	34	35	37	38	39	40

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Obesity Trends* Among U.S. Adults

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)



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Obesity Trends* Among U.S. Adults BRFSS, 1985

(*BMI ≥ 30 , or ~ 30 lbs overweight for 5' 4" person)

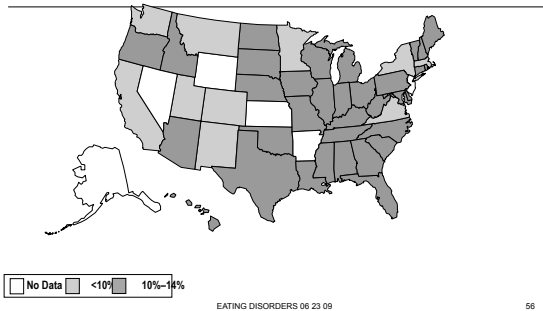


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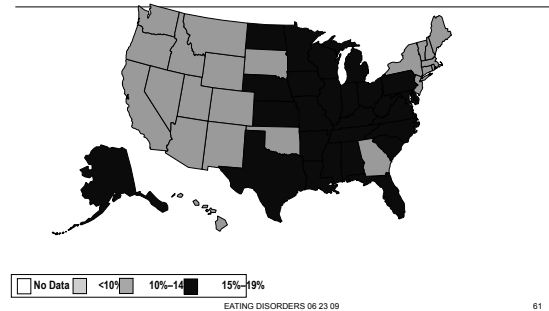
Obesity Trends* Among U.S. Adults BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)



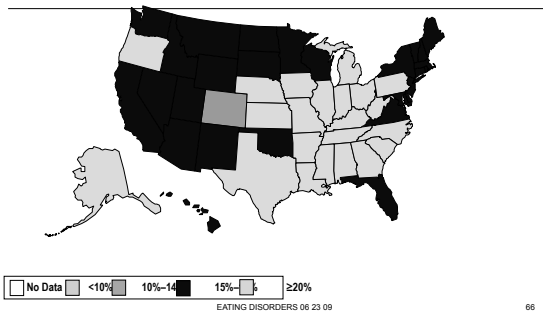
Obesity Trends* Among U.S. Adults BRFSS, 1995

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)



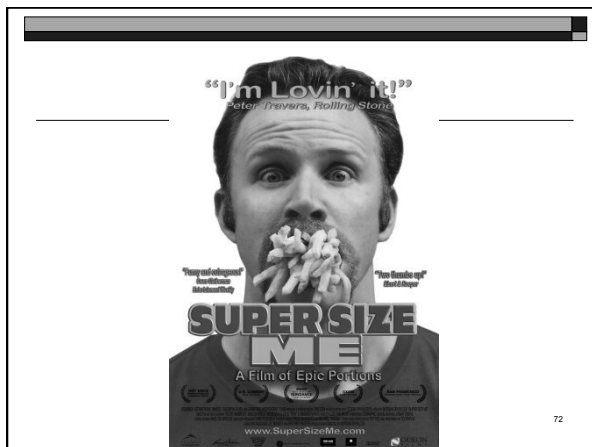
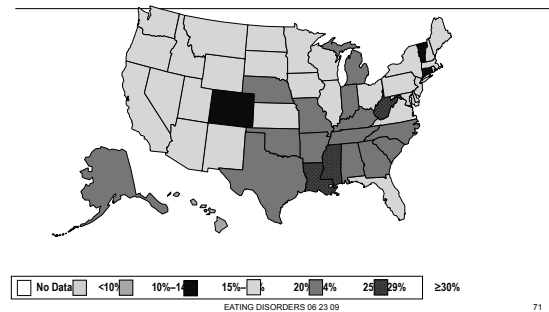
Obesity Trends* Among U.S. Adults BRFSS, 2000

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)



Obesity Trends* Among U.S. Adults BRFSS, 2005

(*BMI ≥30, or ~ 30 lbs overweight for 5' 4" person)



Obesity: known Associations

- Prenatal: mom's caloric intake; maternal DM
- Breastfeeding: protective
- FH: one or both parents
- Energy expenditure: more important than food intake?
- TV: every 2 hours incr obesity 23% and DM 14%

Obesity: known Associations

- Sleep deprivation (Spiegel 2004): causes decrease in leptin and increase in ghrelin
- Eating!
 - “Fast food”: incr weight and insulin resistance (Pereira 2005)
 - EATING DISORDERS: nighttime eating; binge eating disorders

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Eating Disorders: Physical Problems

- Effects of caloric restriction
- Effects of purging
- Effects of overeating

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Effects of Caloric Restriction (Anorexia)

- Osteoporosis/osteopenia
- Cardiac disease/sudden death
- Cognitive problems
- GI dysfunction
- Endocrine changes
- Electrolyte abnormalities
- Infertility

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Effects of Caloric Restriction

- Constipation (vs distorted body image)
- Refeeding syndrome: cardiac collapse when food intake resumes; death due to low phosphate concentration

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Effects of Purging (Bulimia)

- Dental erosion
- Enlarged salivary glands
- “finger sign”
- Esophageal damage

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METABOLIC SYNDROME

What is Metabolic Syndrome?
Metabolic Syndrome Risk Factors
Diagnosis
High Blood Pressure
High Blood Sugar
Abnormal Cholesterol Profile (High/Low)
Medical Conditions Associated with Metabolic Syndrome
What Causes Metabolic Syndrome?
How is Metabolic Syndrome Treated?

Organ Affected by Metabolic Syndrome

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Effects of Overeating: Metabolic Syndrome

- **Elevated waist circumference:**
Men — Equal to or greater than 40 inches (102 cm)
Women — Equal to or greater than 35 inches (88 cm)
- **Elevated triglycerides:**
Equal to or greater than 150 mg/dL
- **Reduced HDL (“good”) cholesterol:**
Men — Less than 40 mg/dL
Women — Less than 50 mg/dL
- **Elevated blood pressure:**
Equal to or greater than 130/85 mm Hg
- **Elevated fasting glucose:**
Equal to or greater than 100 mg/dL

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Causes of Eating Disorders?

- Sexual abuse? (environment)
- Family history (genetics)
 - 6-10X increase if 1st degree relative affected
 - More common in identical than fraternal twins
 - More common if relatives have alcoholism
- Associated with other psychiatric disorders
- Associated with other chemical dependency (B>AN)
- ADDICTION?

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Eating Disorder & Chemical Dependency

- A 19 year old was admitted to residential treatment for cocaine dependency.
- She has been treated in the past for “eating problems” but it “is over now”.

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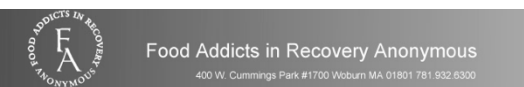
ED + CD

- During the interview, however, she requests permission for:
 - “extra laxatives”
 - Lettuce only for meals
 - Permission to “jog” without supervision
 - Extra vitamin allowance.
- Records review: previous admission to ICU for severe malnutrition.

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Do You Have an Eating Disorder? 20 Questions



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Are You a Food Addict? 20 Questions from FAIR

1. Have you ever wanted to stop eating and found you just couldn't?
2. Do you think about food or your weight constantly?
3. Do you find yourself attempting one diet or food plan after another, with no lasting success?
4. Do you binge and then “get rid of the binge”?
5. Do you eat differently in private than you do in front of other people?

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Are You a Food Addict? 20 Questions from FAIR

6. Has a doctor or family member ever approached you with concerns about your eating/weight?
7. Do you eat large quantities of food at one time (binge)?
8. Is your weight problem due to your “nibbling” all day long?
9. Do you eat to escape from your feelings?
10. Do you eat when you’re not hungry?

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Are You a Food Addict? 20 Questions from FAIR

11. Have you ever discarded food, only to retrieve and eat it later?
12. Do you eat in secret?
13. Do you fast or severely restrict your food intake?
14. Have you ever stolen other people’s food?
15. Have you ever hidden food to make sure you have “enough”?

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Are You a Food Addict? 20 Questions from FAIR

16. Do you feel driven to exercise excessively to control your weight?
17. Do you obsessively calculate the calories you’ve burned against the calories you’ve eaten?
18. Do you frequently feel guilty or ashamed about what you’ve eaten?
19. Are you waiting for your life to begin “when you lose the weight?”
20. Do you feel hopeless about your relationship with food?

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Treatment for ED/Obesity

- Caloric Restriction
- Psychotherapy
- Spiritual
- Medical
- Surgical

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Treatment for ED/Obesity

- Caloric Restriction: if diets worked, the auditorium would be empty tonight.
- Psychotherapy
- Spiritual
- Medical
- Surgical

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Treatment for ED/Obesity

- Psychotherapy: CBT, WW, EDEN
- Spiritual
- Medical
- Surgical

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Treatment for ED/Obesity

- Psychotherapy
- Spiritual: FA, OA, FAA
- Medical
- Surgical

Treatment for ED/Obesity

- Psychotherapy
- Spiritual
- Medical: Stimulants, AD, AED, CB₁I, DAI
- Surgical

Treatment for ED/Obesity

- Psychotherapy
- Spiritual
- Medical
- Surgical: bypass, banding

Spirituality ≠ Religion

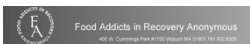
- Belief in a power greater than yourself
- “Turn your will over”
- Accept direction
- Live according to principles

Spirituality ≠ Religion



Twelve Step Programs

- Food Addicts in Recovery Anonymous



- Overeater's Anonymous



Twelve Steps of FA/OA

<http://foodaddicts.org>; <http://oa.org>

1. We admitted we were powerless over food — that our lives had become unmanageable.
2. Came to believe that a Power greater than ourselves could restore us to sanity.
3. Made a decision to turn our will and our lives over to the care of God as we understood Him.
4. Made a searching and fearless moral inventory of ourselves.
5. Admitted to God, to ourselves and to another human being the exact nature of our wrongs.
6. Were entirely ready to have God remove all these defects of character.
7. Humbly asked Him to remove our shortcomings.
8. Made a list of all persons we had harmed and became willing to make amends to them all.
9. Made direct amends to such people wherever possible, except when to do so would injure them or others.
10. Continued to take personal inventory and when we were wrong, promptly admitted it.
11. Sought through prayer and meditation to improve our conscious contact with God as we understood Him, praying only for knowledge of His will for us and the power to carry that out.
12. Having had a spiritual awakening as the result of these Steps, we tried to carry this message to compulsive overeaters and to practice these principles in all our affairs.

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From “Food Addiction: Stories of Men in Recovery”

- Being a man, I learned I was not supposed to worry about my weight. When I stopped drinking alcohol...my weight began to rise, and no matter what I tried, I could not control it. Food had become my alternative to alcohol.
- In FA, I was able to recognize that certain foods are addictive substances for me. I learned how to weigh and measure my food, putting boundaries around my meals. I have been able to return to the athletic activities that had become too painful...In FA, I am learning how to face life without using food as a drug.

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Treatment of AN/BN

- Cognitive Behavioral Therapy (Lewandowski 1997)
- Interpersonal therapy
- Medications:
 - For AN: little data, ? Olanzapine
 - BN: fluoxetine, ? Ondansetron
- Hospitalization
- OA (Malenbaum 1988)

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Medications for Obesity: Stimulants

- Phentermine (Adipex)
- Diethylpropion (Tenuate)
- Sibutramine (Meridia) (also serotonin)
- Ephedra/ Ma Huang

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Medications for Obesity: Antidepressants

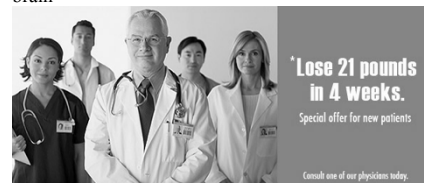
- Act on serotonin:
 - Sertraline (Zoloft)
 - Fluoxetine (Prozac)
- Act on norepi/dopamine:
 - Bupropion

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Medications for Obesity: Antiepileptics

- Topiramate (Topomax)
 - Commonly used for migraine prophylaxis
 - Produces “topomax brain”



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Medications for Obesity: EC antagonists (Rimonabant, Acomplia)

- CB1 receptor blocker
- Compared to placebo:
 - 5% BW loss: 51 vs 19%
 - 10% BW loss: 27 vs 7%
 - DEPRESSION: did not get FDA approval

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Medications for Obesity: mu antagonists (naltrexone, Vivitrol)

- May block the “reward” of eating through the mu opioid receptor → DA release
- Used to block the reward of alcohol, tobacco?
- ? Blocks natural endorphins
- Blocks the ability of anyone in the ER to give you pain meds when you break your leg!

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Bariatric Surgery

- Indications
- Contraindications
- Complications

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Bariatric Surgery

- Indications:
 - BMI > 40 or 35 with complications
 - Have failed medical therapy
 - Surgical candidates

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Bariatric Surgery

- Contraindications
 - Binge eating disorder
 - Current drug and alcohol use
 - Untreated MDD or psychosis

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Bariatric Surgery

- Complications
 - Mortality: 1 – 20% ?
 - Malabsorption
 - Post-surgical complications
 - ? Addictive disorders

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SOS Study: Swedish Obese Subjects

- Randomized to either bariatric surgery or “conventional” treatment
- “conventional” treatment gained 2% over 10 years
- Surgery group lost 16 % over 10 years

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BRAIN SCANS

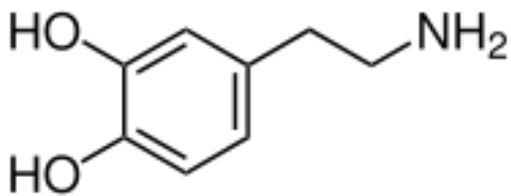
apologies to PETA



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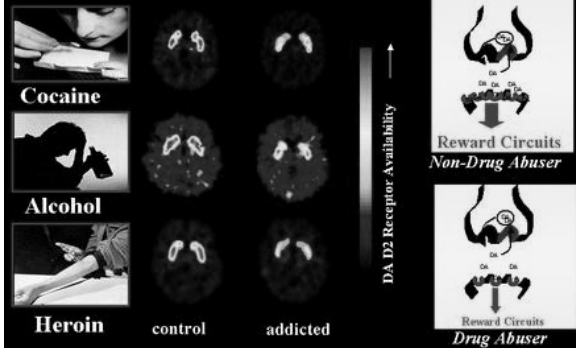
Dopamine



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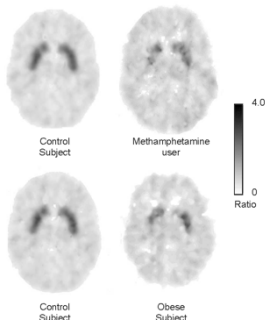
112

Dopamine D2 Receptors are Lower in Addiction



Obese subjects have decreased DA

[¹¹C]Raclopride



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Dopamine: Normal vs. Overweight



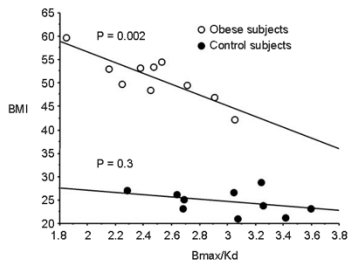
Normal

Overweight

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Dopamine Receptors: Normal vs. Obese

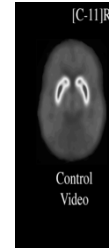
FIGURE 2. Linear regression between dopamine receptor availability (Bmax/Kd) and body mass index (BMI: kg/m²) in obese and control subjects. Modified from reference 59.



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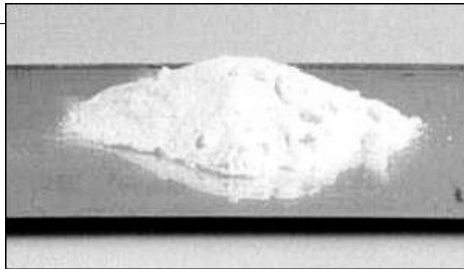
Effect of Cocaine Cues on Dopamine

- A cocaine addict is shown a picture of Bambi in the forest.
- The large amount of “red” indicates that dopamine hasn’t been released.



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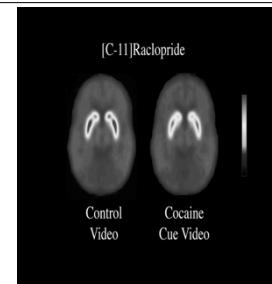


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Effect of Cocaine Cues on Dopamine

- The picture on the right shows less “red” =
- Dopamine has been released.
- THE CUE OF SEEING COCAINE CAUSED DOPAMINE RELEASE
- = RISK OF RELAPSE

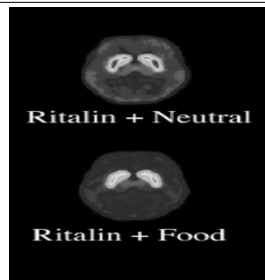


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Volkow: Placebo Ritalin Food

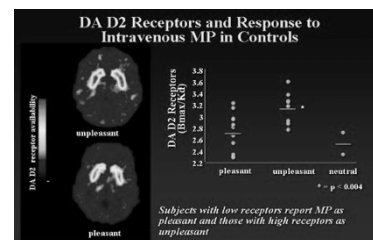
- The sight of food caused a release of dopamine, just like cocaine!
- In this “addict”, the drug is FOOD



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Abnormal response to Ritalin is due to abnormal brain chemistry



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Where to get help

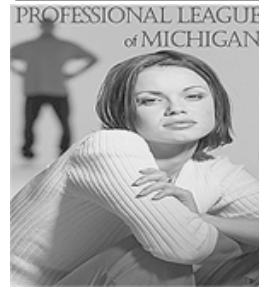


- Overeater's Anonymous
- <http://www.oa.org>

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Where to get help



- Eating Disorders League of Michigan
- <http://www.edleague.com/>

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Where to get help



- EDEN
- <http://www.edenclub.org/>

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Where to Get Help



- Food Addicts in Recovery Anonymous
- <http://foodaddicts.org>

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DAKOTA 1995-2007



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 - ccmdphd@mac.com

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