Solutions:
Support for Emotional and Binge Eating

Session 2: The Brain and Eating

POSITIVE CHOICE INTEGRATIVE WELLNESS CENTER thrive San Diego, CA

Let’s get to know one another!

- Tell us your first name
- What is one thing you hope to learn from this class?

Check-In

- What is one success and one challenge from the past week? How did you support yourself through these experiences?
- Did you choose any new behaviors in response to triggers and emotions? What were they?
- How can the group support you this week?

Quote of the Week

"Most weight problems occur between the ears, which may explain why most diets don't work. It's the brain that makes our eating decisions, and what we've found is that there isn't just one brain pattern associated with overeating—there are at least five. So, giving everyone the same diet plan will make some people better and some worse."

-Dr. Daniel Amen, MD

Defining the Problem

Physical and mental health researchers and clinicians don't have a widely accepted definition for what some call a "food addiction." Although numerous research studies have been, and continue to be, conducted to pinpoint a common definition, it's still unclear whether the condition is a food or eating addiction, an impulse control disorder, or an eating disorder.

How do you define your behaviors with food? Why?

POSITIVE CHOICE INTEGRATIVE WELLNESS CENTER | thrive San Diego, CA

Defining the Problem

Similarities between compulsive eating patterns and other substance use disorders:

- Obsessions about using a behavior or substance
- Impulsiveness and/or compulsions to seek and use a behavior or substance
- May get a “natural high” from eating, similar to that seen with alcohol/drugs
  - Hyperpalatable foods and illicit drugs both stimulate pleasure centers in the brain.
- Difficulty stopping use of the behaviors or substance
- Loss of control over how much and when you use
- Negative impacts in multiple areas of your life as use continues and increases

Defining the Problem

Differences between compulsive eating patterns and other substance use disorders:

- Drugs affect the brain differently than highly palatable foods do.
  - Food doesn't cause an immediate altered mental state as drugs do.
- We don't have to take potentially addictive drugs, but we will always need to eat
  - We cannot abstain from food.
- Imposing dietary restraint and restrictions often backfires, leading to overconsumption once food is allowed back into one's life.
  - Research studies have shown that it is not the exposure to highly palatable foods (high sugar/high fat foods) that leads to obsessions, cravings, and binge-like behaviors, but rather it is more so the deprivation of them.

Important terms to know about the brain:

- **Neurotransmitters-** chemical messengers relaying information within the brain. Their strength or weakness plays an important role in people's behavioral abilities, including eating patterns. Two key neurotransmitters are dopamine and serotonin.

- **Dopamine-** chemical in the brain responsible for feelings of pleasure and reward. Sweeter, saltier, and fatty foods have all been shown in some studies to cause the brain to pump out excessive dopamine, registering as highly pleasurable and increasing the importance of these foods in our minds.

- **Serotonin-** thought of as the happy, anti-worry, flexibility chemical. When serotonin levels are low, people tend to be worried, rigid, inflexible, oppositional, and argumentative.

Important terms to know about behaviors:

- **Impulsivity-** tendency to act quickly without planning or thinking about consequences. Driven by the desire to obtain pleasure, arousal, or gratification.

- **Compulsivity-** being aware of the consequences of a behavior and feeling drawn to it anyway. Driven more by the desire to reduce or alleviate tension, anxiety, or any other emotional discomfort.

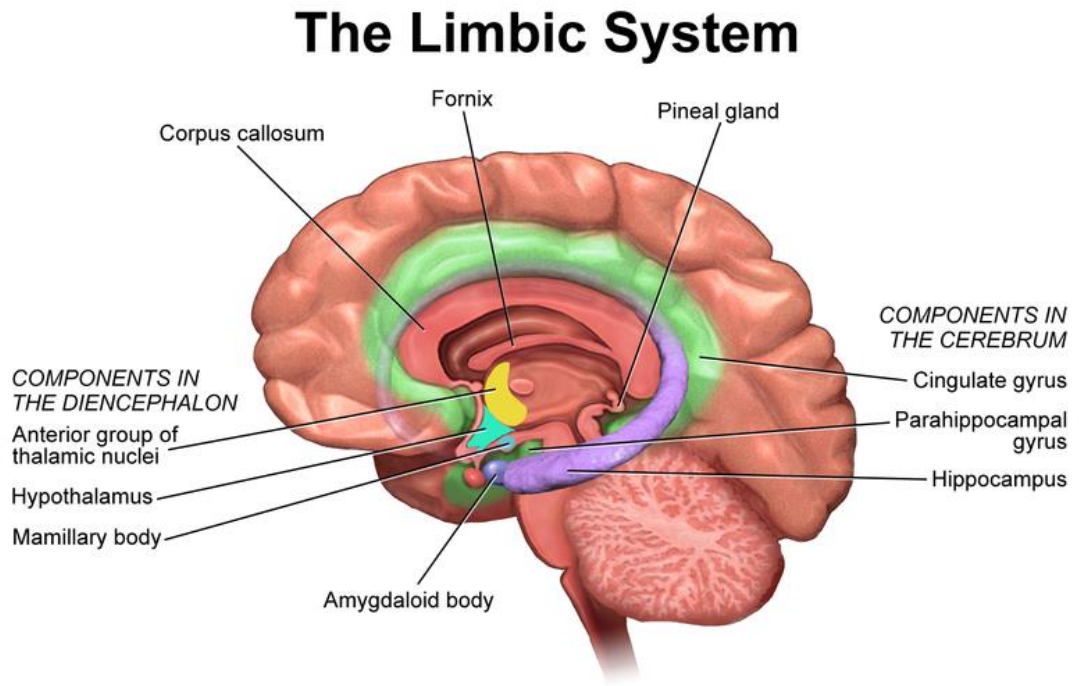
Behaviors that initially begin as impulsive can become compulsive later on.

How have your behaviors with food been impulsive and/or compulsive?

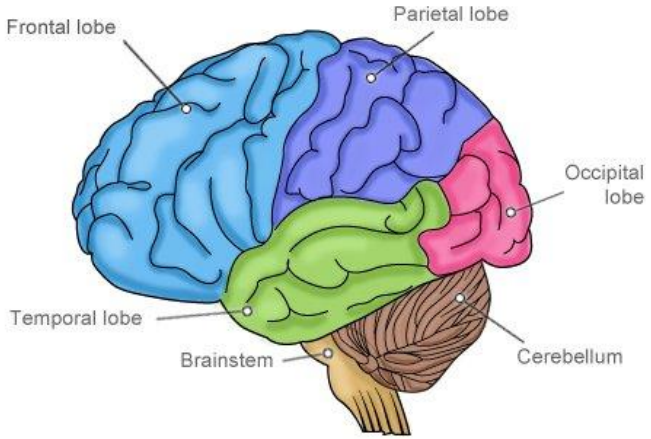
Areas of the Brain

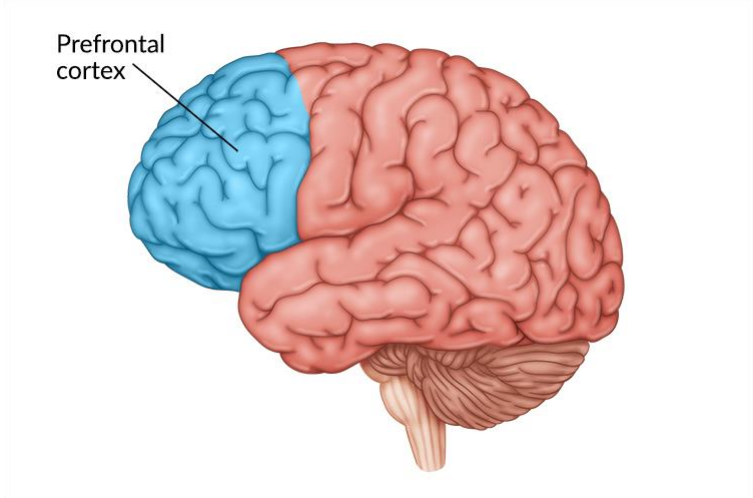
Limbic System

- Includes the hypothalamus, hippocampus, and amygdala.
- Facilitates memory storage/retrieval, establishes emotional states, and links the conscious, intellectual functions of the cerebral cortex with the unconscious, autonomic functions of the brain stem.
- Survival is neurochemically supported in powerful feedback mechanisms for avoidance of pain and repetition of pleasure.
- Primary seat of emotion, behavior, motivation, and long-term memories. It is often referred to as the “emotional brain.”



Areas of the Brain

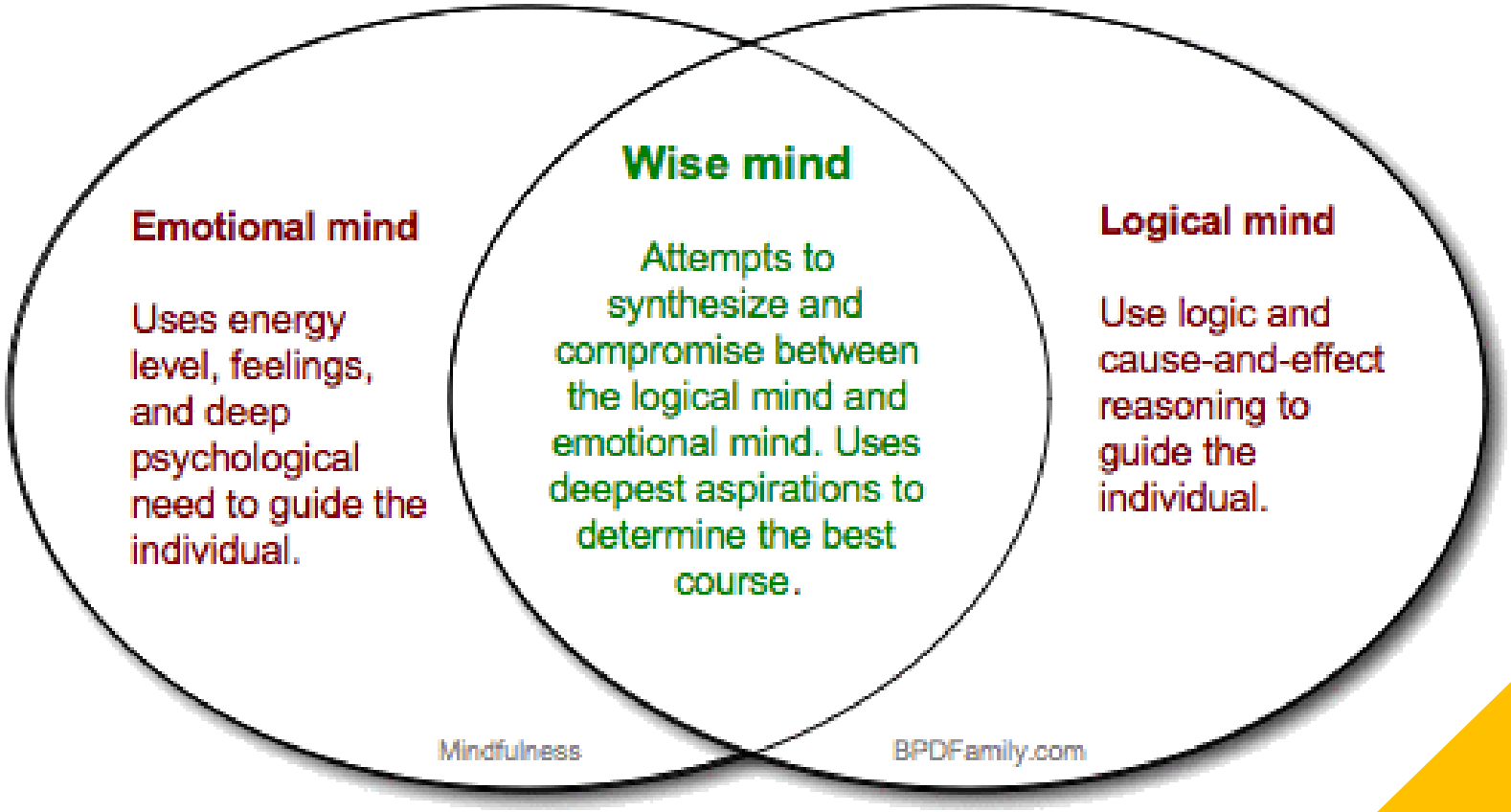




Cerebral Cortex

- Plays a key role in memory, thinking, learning, reasoning, problem-solving, emotions, consciousness, and functions related to your senses.
- The prefrontal cortex (PFC) is our executive thinker, often referred to as the “rational brain,” and is implicated in planning, complex thinking, personality expression, decision making, sustaining attention on a project, and moderating social behaviors.
- Ideally intervenes during emotional experiences to help us respond appropriately to the situation so that decisions are not purely limbic or purely cortical

Recovery behaviors stem from Wise Mind



Dopamine and Reward

Dopamine is a chemical in our brain responsible for feelings of pleasure and reward. It motivates us to obtain things that bring us pleasure.

- Pleasurable sensations originate in the dopamine reward center, located in the “emotional brain.”
- Anything that provides pleasure will affect the dopamine reward center.
- Using food/eating to provide comfort or decrease emotional pain locks into the same mechanism that drives you toward life-sustaining activities– leading to obsessions with eating and strong compulsions to binge on foods that will increase pleasure or decrease discomfort.

Dopamine and Patterns of Behavior

Some people have difficulty experiencing feelings of pleasure or satisfaction due to abnormally low levels of D2 receptors in the brain (Blum, et al., 2000).

- The brain has a harder time “detecting” the pleasure signal carried by dopamine, leading us to do more of the pleasurable activity.
- Can result in a cluster of disorders that involve addictive behaviors, impulsivity, and compulsivity.
- May contribute to people with binge-type eating disorders being at a higher risk for another addiction.
- Result of both genetic and environmental factors.

Environmental Factors Influencing Dopamine Receptors

Understanding what might contribute to less dopamine receptors can help reduce feelings of guilt and shame about your eating habits and begin to see how you can overcome them:

- Genetic predisposition- passed down from parents with similar issues
- Prenatal conditions- mother's substance use, malnutrition in prenatal period
- Malnutrition- poor diet (due to poverty, low-calorie dieting, food allergies/sensitivities) that disrupt ability to absorb nutrients
- Severe or ongoing stress
- Heavy or prolonged use of drugs or alcohol
- Childhood trauma, abuse, or neglect

Dieting and abundance make things worse…

Deprivation of highly palatable foods, not the exposure to it, induces more intense cravings. This restriction has also been shown to cause stress that then leads to binge-like behaviors and relapse (Bassareo and Di Chiara 1997; Teegarden and Bale 2007).

Abundance of exposure to food triggers the desire to eat at inappropriate times, eat when you're not physically hungry, eat more than your body needs, or to eat certain types of food for emotional comfort. Why?

Your brain is constantly activated by food cues, triggering the release of dopamine, and motivating you to eat more. This is especially true when you've deprived yourself of foods you want or like because the period of deprivation increases the pleasurable effect of food upon the next exposure.

Stimulating Dopamine

Natural reinforcers- events that increase the feeling of pleasure or reward by stimulating dopamine release in the brain.

Taking positive actions on a regular basis to shift from emotional responses to more mindful responses can eventually reduce the intensity of obsession, cravings, and behaviors with food and eating.

Examples: meditation, spiritual acceptance, love of others, physical activity, participation in recovery groups, etc.

What are some examples of positive reinforcers that you might find helpful to naturally increase dopamine? (Hint: think moderately pleasurable and enjoyable and realistic to build into your lifestyle regularly.)

Why are natural reinforcers hard to choose at first?

- Repeated high doses of dopamine raises the brain's threshold for that amount of pleasure.
- Things that don't produce as much dopamine as the new threshold seem less pleasurable and "not enough" than they did when the threshold was lower.
- The threshold can lower and reset, but research suggests this could take around 3-4 weeks.
- Satisfaction with new choices is harder at first. We must find ways to help ourselves through the discomfort of our brain motivating us to use the more pleasurable option until the threshold lowers.
- With food and eating, periods of deprivation also raises the pleasurable effect of dopamine for highly palatable foods, which is why moderation is ideal.

Any last thoughts or questions?

References

Bassareo, V., and G. Di Chiara. 1997. “Differential Influence of Associative and Nonassociative Learning Mechanisms on the Responsiveness of Prefrontal and Accumbal Dopamine Transmission to Food Stimuli in Rats Fed *Ad Libitum*.” *Journal of Neuroscience* 17: 851-861.

Blum, K., E. R. Braverman, J. M. Holder, J. O. Lubar, V. J. Monastra, D. Milller, T. J. H. Chen and D. E. Comings. 2000. “The Reward Deficiency Syndrome: A Biogenetic Model for the Diagnosis and Treatment of Impulsive, Addictive, and Compulsive Behaviors.” *Journal of Psychoactive Drugs* 32 Suppl: i-iv, 1-112.

Teegarden, S. L., and T. L. Bale. 2007. “Decreases in Dietary Preference Produce Increased Emotionality and Risk for Dietary Relapse.” *Biological Psychiatry* 61: 1021-1029.