Webinar Learning Objectives

1. Participants will be able to identify the neurotransmitter most prominent with eating disorders and the reward circuitry in our brain.

2. Participants will be able to identify the primary elements of an “abstinence model” as applied to food addiction treatment.

3. Participants will be become familiar with the most common diagnoses associated with an eating disorder and substance use disorders.
Tolerance
Withdrawal Symptoms
More For Longer Periods Than Intended
Unsuccessful Effort To Cut Back Or Control
Significant Time To Obtain Or Recover From Effects
Giving up social, occupational, recreational, activities because of substance use
Continuation Despite Consequences

* LEVEL OF DEPENDENCY: MILD 2-3 MODERATE 4-5 SEVERE 6+
FOOD ADDICTION – IS THERE SUCH A THING?

The “Naysayers” -
Drug addiction, alcohol dependency, and process addictions [e.g. compulsive gambling] are substances and behaviors that are not necessary for life. **Food is.**

The “Believers” -
But so is water and air – However, people do not consume water & air beyond their biological needs or in ways that threaten their survival. So perhaps the problem is semantics.

drug addiction... not all drugs are addictive
food addiction... not all foods are addictive
“Food addiction is a disease causing loss of control over the ability to stop eating certain foods. Scientifically, food addiction is a cluster of chemical dependencies on specific foods or food in general; after the ingestion of highly palatable foods such as sugar, excess fat and/or salt the brains of some people develop a physical craving for these foods. Over time, the progressive eating of these foods distorts a person’s thinking and leads to negative consequences they do not want but cannot stop.”

- Phil Werdel, M.S., A.C.O.R.N. - FAI
“Much more often than not, disordered eating is approached as a psychological problem involving poor impulse control and “emotional eating.”

Not recognizing, and treating, the biological drivers of food cravings and overeating often leads to a poor outcome of treatment. Likewise for restricting types of eating disorders.

Treatment of an eating disorder demands attention to the **nature of the substance** [properties of the foods consumed], the **nature of the person** [psychological contributors] and the **biology of the individual.”

- Marty Lerner, PhD., A Guide to Eating Disorder Recovery 2013
DYNAMICS OF PATHOLOGICAL EATING

- **Genetics?** Appetite Gene, ED Gene(s)?
- **Reward Circuits?** – **Dopamine/ Opioid** Receptors
- Role of **Serotonin** and effect on Mood, **Dopamine** & Reward
- Classical **Conditioning/Associative Learning?**
- **External** food [salient] **cues** “trumping” **internal cues**
- **Hormonal** – ghrelin, leptin, insulin controlled?
- **Emotional** Eating
- **Processed foods,** “junk food environment” / **potency**
- Plasticity and **Cross Addiction?**
- **Switching** forms of **eating disorders**
- **Stress** > Cortisol > Increased [or decreased] **Appetite**
WHAT HAVE WE LEARNED?
WHO HAVE WE STUDIED?
A COUPLE OF VOLUNTEERS....

DUDE...
I HOPE THIS EXPERIMENT NEVER ENDS

OREO

STUDY SHOWS THAT OREOS MAY BE MORE ADDICTIVE THAN COCAINE.
### Summary

Common dietary obesity and DSM IV criteria for addictive disorders. Three of the 7 criteria need to be met for diagnosis.

<table>
<thead>
<tr>
<th>DSM IV criteria</th>
<th>Animal model</th>
<th>Humans</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tolerance</td>
<td>✓</td>
<td>✓</td>
<td>Food bringing, hyperphagia, delayed satiety</td>
</tr>
<tr>
<td>2 Withdrawal</td>
<td>✓</td>
<td>✓</td>
<td>Hypofunctioning brain dopamine system, opiate withdrawal-like symptoms, psychological and physical dependence</td>
</tr>
<tr>
<td>3 Use more than intended in longer periods of time</td>
<td>✓</td>
<td>✓</td>
<td>Hyperphagia, change of eating patterns and meal frequency (snacking), negative experience triggers, cue-induced behaviors, larger portion size, proximity to food sources, lower cost of high-energy foods</td>
</tr>
<tr>
<td>4 Attempts to cut back</td>
<td>✓</td>
<td></td>
<td>Dietary restraint Participation in weight loss programs</td>
</tr>
<tr>
<td>5 Spend time in the pursuit/use/recovery of the substance</td>
<td>✓</td>
<td>✓</td>
<td>Anticipation and preoccupation, cravings, food thoughts, increased brain dopamine levels in response to anticipation and consumption, negative experience triggers, cue-induced behaviors, change of eating patterns and meal frequency, increase in habitual (vs. physical) hunger</td>
</tr>
<tr>
<td>6 Missed important activities</td>
<td>✓</td>
<td>✓</td>
<td>Social &amp; occupational activities given up, social marginalization, psychological distress, discrimination</td>
</tr>
<tr>
<td>7 Persistent behavior in spite of knowledge of consequences</td>
<td>✓</td>
<td>✓</td>
<td>Lack of diet compliance, failure to achieve long-term weight loss, hyperphagia resistant to aversive cues</td>
</tr>
</tbody>
</table>
The brain's pleasure center, called the nucleus accumbens, is essential for our survival as a species... Turn off pleasure, and you turn off the will to live... But long-term stimulation of the pleasure center drives the process of addiction... When you consume any substance of abuse, including sugar, the nucleus accumbens receives a dopamine signal, from which you experience pleasure. And so you consume more.
DOPAMINE – THE “FEEL GOOD” NEUROTRANSMITTER

The greater the expectation and experience of the substance, the “stronger” the dopamine signal. [Classical Conditioning – “Pavlovian”]

Drugs such as cocaine, amphetamines, alcohol, opiates stimulate increased levels of dopamine. [cross addiction]

D2 Receptor deficiencies will develop in response to repeated use / abuse of substances. The down regulation of D2 receptors creates tolerance.

Dopamine deficiencies are thought to motivate drug seeking behavior / craving in an attempt to avoid withdrawal or experience the prior pleasant feelings. “Chasing the original high” – initial [feels good] middle stage [less good] end [avoid pain of withdrawal]
Research has shown that the brain begins responding to fatty and sugary foods even before they enter our mouth. Merely seeing a desirable item excites the reward circuit. As soon as such a dish touches the tongue, taste buds send signals to various regions of the brain, which in turn responds by spewing the neurochemical dopamine. The result is an intense feeling of pleasure. *

Nicole Avena, PhD., Hedonic Eating: How the Pleasure of Foods Affects our Brains and Behavior, Oxford University Press, 2015
Walking Past the Food Court and Mrs. Field’s
Visual and Olfactory External Cues: Control vrs BED Subjects
REWARD CIRCUITRY
THE MORE PROCESSED….THE MORE ADDICTIVE:
ETIOLOGY OF AN EPIDEMIC

Coca Leaf > Cocaine > Crack Cocaine
Poppy Plant > Opium > Morphine > Heroin
Grapes / Grains > Alcohol 6-12% > 40-50%
Tobacco Plant > Pipes > Cigarettes

Sugar Cane > Sugar > HFC [1970]
Sugar, Salt, Fat > processed “bliss foods”
combining these [chips, snack foods, etc]

CORN > FRITO’S CORN CHIPS = BLISS POINT
Frequently overeating highly palatable foods saturates the brain with so much dopamine that it eventually adapts by desensitizing itself, reducing the number of cellular receptors that recognize and respond to the neurochemical.

Consequently, the brains of overeaters demand a lot more sugar and fat to reach the same threshold of pleasure as they once experienced with smaller amounts of the foods. These people may, in fact, continue to overeat as a way of recapturing or even maintaining a sense of well-being –

Robert Lustig, MD., UC Medical School, San Diego – Chair Dept. Pediatric Endocrinology
The New York Times last year reported that Coke had paid for scientific research that downplayed the link between sugary drinks and obesity. After that article was published, the beverage giant released a database showing that since 2010 it had spent more than $120 million on academic research and partnerships with health organizations involved in curbing obesity.
Is Sugar the “New Tobacco?”
“bet you can’t eat just one”...
Now a word from our sponsors….

*Coke* beneficiaries include the *Academy of Pediatrics*, as well as a number of respected medical and health groups, including $3.1 million to the *American College of Cardiology*, more than $3.5 million to the *American Academy of Family Physicians*, $2 million to the *American Cancer Society* and roughly $1.7 million to the country’s largest organization of dietitians, the *Academy of Nutrition and Dietetics*.

*McDonalds* has done the same as well as other fast and junk food manufacturers and was biggest sponsor to 2015 Annual Meeting of the American Dietetic Association.

*N.Y. Times*
*September 28, 2015*
NEUROPLASTICITY, CHRONICITY, RELAPSE

There appears to be plasticity associated with the addiction phenomenon in general as well as changes produced by addiction to specific addicting drugs. These findings also provide the basis for the current understanding of addiction as a chronic, relapsing disease of the brain with changes that persist long after the last use of the drug. Hence, the neuroplasticity in brain circuits and cell function induced by addictive substances [and behaviors] that are thought to underlie the compulsions to resume addictive behavior warrant further exploration. These investigations have significant implications for future therapies and treatments.
Opposite of tolerance – repeated abuse of a substance will create a significant “sensitivity” or dopamine release with related substances [cross addiction].

Binge eaters, in particular with sugar, will be more “sensitive to the effects of alcohol and cocaine than non-binge eaters.

Although tolerance is reversible it appears sensitization remains for extended periods and even a small amount of the offending substance [or behavior] will result in a heightened response. [See next slide]

Supports “gateway” substances.
What Happens to Brain with A Lapse / Relapse

Sugar Addict’s Brain Scan

“Regular” Person Brain Scan

Receptor Response to Sugar
A Few Words About Restricting, Dieting, and AN

One might ask… How can anorexia be an addictive illness?

There are two forms of Anorexia – 1. Restricting Type

2. Purging Type

Avoidant / Restrictive Food Intake Disorder – no body image issue but an extreme concern of the effects [aversive] of eating most foods.

Orthorexia – progressive list of unhealthy foods to the point of being unable or unwilling to sustain reasonable nutritional needs.

OCD or Eating Disorder or Process Addiction …. You decide
“If anorexic individuals experience endogenous DA release as anxiogenic [anxiety provoking] rather than hedonic, this may explain their pursuit of starvation, because food refusal may be an effective means of diminishing the anxious feelings associated with the disorder.” [negative reinforcement]

Avoidant Behaviors = Negative Reinforcement
[Addiction to Dieting / Restricting]
“Many people with AN exercise compulsively and find little in life rewarding aside from the pursuit of weight loss. Like other traits, these too persist, in a more modest form, after recovery. These particular traits all involve the neurotransmitter dopamine, which contributes to altered reward and affect, decision-making, and executive control. There is considerable evidence that altered function of dopamine occurs in AN possibly contributing to over-exercise and decreased food intake.”

Eating Disorders Center for Treatment and Research, University of California School of Medicine*


Cocaine Study - restricting anorexics controls / pleasant or adverse experience
Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry.

Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in the individual pursuing reward and/or relief by substance use and other behaviors.

The addiction is characterized by impairment in behavioral control, craving, inability to consistently abstain, and diminished recognition of significant problems with one’s behaviors and interpersonal relationships. Like other chronic diseases, addiction involves cycles of relapse and remission. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death.
A Few Medical / Physical Consequences of Eating Disorders

PSYCHIATRIC – SUICIDE, DEPRESSION, ANXIETY DISORDERS
CARDIOVASCULAR DISEASES – ARTHROSCEROSIS, CARDIOMYOPAPHY
SIGNIFICANT INCREASE RISK OF CANCER
HYPERTENSION, OBESITY, ATONIC / CATHARTIC BOWEL DISEASE
SUDDEN DEATH SYNDROME / CARDIAC ARYTHMIA
GASTROPORESIS
SEVERE ELECTROLYTE DISTURBANCE – CARDIAC, RENAL DISEASE
DEATH* EATING DISORDERS = HIGHEST RATE OF MORTALITY OF ANY PSYCHIATRIC ILLNESS.
ATONIC BOWEL SYNDROME

Constipation

- Stimulant laxatives can cause damage to the nerve plexus of the colon
- Leaves a large, floppy colon unable to propel stool
- Dose at which this may occur is unknown
- There is NO TAPERING off stimulant laxatives
Cathartic Colon Syndrome
COMPLICATIONS

Gastroparesis

- Symptoms
  - Nausea
  - Early satiety
  - Bloating
  - Flatus
  - Abdominal pain
  - Acid Reflux
- Believe patients, its not ED talking!
"All truth passes through three stages…
First, it is ridiculed.
Second, it is violently opposed.
Third, it is accepted as being self-evident."

Arthur Schopenhauer German philosopher (1788 – 1860)
Free eBook at www.Milestonesprogram.org

800-347-2364

A Guide To

eating disorder recovery

Marty Lerner, PhD.
Defining the Problem and Finding the Solution
Thank You!

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mlerner@milestonesprogram.org

Milestones In Recovery, Inc.
Polling Question #1
Add questions and answers
Polling Question #2
Add questions and answers
Polling Question #3
Add questions and answers