Welcome
OEAP Annual Resource Conference

Understanding Substance Abuse: Current Trends in Treatment and Recovery
September 15, 2015
State Fire Marshal Training Academy

Neurotransmitters Made Easy: Chemistry, Mood, and Addiction

Learner’s Guide

Presenter: Brad Lander, Ph.D.
The Ohio State University, Talbot Hall
Understanding Addiction: Squirrel Logic

Brad Lander PhD, LICDC
Clinical Director / Psychologist

Talbot Hall - Addiction Medicine at The Ohio State University
Wexner Medical Center

1. The greatest problem we have working with alcoholics and addicts is our own beliefs and expectations

2. The addict is always doing the best he/she can

A View of Behavior

1. All behavior comes from the brain

2. The brain is chemical

3. Chemistry follows LAWS of physics/math

Behavior

- Thought
- Emotion
- Senses
- Movement
- Memory
  - Immediate Recall
  - Short Term
  - Long Term

So...

IF... All behavior ➔ brain AND The brain is chemical AND Chemistry follows laws of Mathematics...

THEN: All behavior follows the LAWS of mathematics

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The Pleasure Principle

The brain is built to repeat any behavior that stimulates this part of the brain

"if it feels good, it must be good for me."

... and it must be repeated

Function of The Reward Pathways

In animals (including humans) the reward pathways are activated by:

- Food
- Water
- Sex

The Effects of Alcohol/Drugs on Behavior

-Brad Lander, Phd, LICDC-CS
Brain Protection

- Brain protected by bone (skull)
- Fluid layer protects against shocks
- Blood-brain barrier

Let's Take a Drink

- **Thought**
  - Logic, Judgment, Prediction, Decision-making
- **Emotion**
  - Anger, Fear, Elation, Sadness
- **Senses**
- **Movement**
- **Memory**

Activation of the reward pathway by addictive drugs

Alcoholic Family Tree 1

Alcoholic Family Tree 2

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Neurotransmitter Replacement

OR

"The law of no free lunch"

Serotonin Present in Cerebral Cortex Neurons

Normal 7 weeks after Ecstasy 7 years after Ecstasy

Cocaine Abuser (10 days)

Cocaine Abuser (100 days)

SPECT Scan

Normal Chronic Alcoholic

Healthy 25 year opiate user

• Brad Lander, Phd, LICDC-CS
Marijuana abuse decreases brain activity.

Neurotransmitter Imbalances

<table>
<thead>
<tr>
<th>Imbalances of...</th>
<th>Results in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serotonin</td>
<td>Depression/Eating DO</td>
</tr>
<tr>
<td>Dopamine</td>
<td>Schizophrenia</td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>Anxiety/Depression</td>
</tr>
<tr>
<td>Glutamate</td>
<td>OCD/PTSD</td>
</tr>
<tr>
<td>GABA</td>
<td>Anxiety/Panic</td>
</tr>
</tbody>
</table>

ADDICTION

Brain Shape (Design)

Factors

1. DNA
2. Oxygen & Nutrients
3. Environment

Down Regulation

Endorphin

Opiate

Pain
Adaptation To Drug

- Consistent drug use is a "new environment" - adaptation occurs
- The reward system is "re-engineered"
- The drug takes on the properties of the activities that naturally create sensations of pleasure (food, water, sex)

ASAM Definition

- The American Society of Addiction Medicine (ASAM) - August 2011
- Defines Addiction as a "Chronic Brain Disease"
  "Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry."

- Must be treated, managed and monitored over a person's lifetime
- As a chronic disease, periods of relapse are a common feature of addiction [however] the return to drug use is not inevitable
- In addiction there is a significant impairment of executive functioning that manifests itself in problems with perception, learning, impulse control, compulsivity and judgment

The Evolution of the Cerebrum

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The Adolescent Brain

- Major growth occurs in the PFC between ages 13 - 26
- Adolescents can become addicted 5x faster than adults
- People who start using as teenagers have immature PFC's

Brain Distress

In distress, the most intricate and sophisticated areas of the brain are affected first.

Prefrontal cortex

Loss of PFC Power

- Fatigue
- Unbalanced glucose levels
- Stress
- Pain
- Illness
- Alcohol / drug use

Empowering The Midbrain

EXPOSURE

Contact with anything associated with use:

- People
- Places
- Things
Goals of Treatment
- Cessation and abstinence from all dopamine-surring chemicals
- Brain chemistry stabilization
- Empowerment to steer behavior with the prefrontal cortex
- Eliminate/reduce environmental triggers
- Enhance neuroadaptation to recovery
- Become comfortable with not using

Post Acute Withdrawal (PAWS)
- Withdrawal-like symptoms occur intermittently in the early stages of recovery
- They are made worse by stress but may arise at unexpected times and for no apparent reason
- They may last for a day or for weeks

Symptoms of (PAWS)
- Inability to think clearly
- Memory problems
- No energy
- Emotional overreactions or numbness
- Sleep disturbances
- Physical coordination problems
- Stress sensitivity
- Increased sensitivity to pain
- Muscle aches

Treatment Tasks
Physical Stability
- Sleep
- Balance blood sugar
- Exercise
- Relaxation/meditation

Mental/Neural Strengthening
- Develop new neural pathways
- Learn recovery skills
- Counseling
- Quit smoking

• Brad Lander, Phd, LICDC-CS
Counseling
- Therapy makes structural/chemical changes to the brain

Environmental Management
- Safe place to live
- Triggers lists
- Management plan

Acute Pain Management
- Acute injury
- Surgery
- Illness
  - Pancreatitis
  - Sickle Cell crisis

Immersion into sober activities with sober people
12-step activity
- Meetings
- Sponsor (guide)
- "Extracurriculars" such as dances, pot lucks, conferences, etc.
- Online meetings/resources

Quit Smoking
- Nicotine depletes serotonin
- The seriousness of suicidal behavior is directly correlated with amount of cigarette smoking
- Recovery rates for non-smokers is double that of smokers regardless of when the smoking stopped

Medication-Assisted Treatment
- Comprehensive Maintenance
  - Medication plus counseling and support services
- Medical Maintenance
  - Daily Medication only
- Detoxification
  - Short-term - 5-10 days
- Medically Supervised Withdrawal
  - Long-term taper - 6 weeks to 2 years

Alcohol
Acamprosate (Campral)
Naltrexone (Revia, Vivitrol)

Opiates
Partial agonists (Buprenorphine Suboxone, Subutex)
Full agonist (Methadone)
Antagonist (Naltrexone, Revia, Vivitrol)

Brad Lander, Phd, LICDC-CS
Factors Predicting Treatment Success

- Support from family and friends
- Adequate medical insurance or financial resources
- Pressure to stay in treatment
  - Criminal justice system, child protective services, family, employer
- Motivation to change
- Adequate lengths of treatment: the longer a client is engaged, the better the outcomes

Coerced treatment

- Evidence shows that substance abuse treatment for people that are court ordered to treatment equally effective as for voluntary participants
- "Pressure" to stay in treatment helpful to the patient's long-term success

Reasons for Not Receiving Substance Use Treatment among Persons Who Made an Effort to Get Treatment But Did Not Receive It 2008-2009 Combined

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percent Receiving Reason</th>
</tr>
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<tbody>
<tr>
<td>No health care available and could not afford costs</td>
<td>36.3%</td>
</tr>
<tr>
<td>Not ready to stop using</td>
<td>26.7%</td>
</tr>
<tr>
<td>Able to handle problem without treatment</td>
<td>10.2%</td>
</tr>
<tr>
<td>No transportation/inconvenient</td>
<td>8.7%</td>
</tr>
<tr>
<td>Had health coverage but did not cover treatment or did not cover cost</td>
<td>6.5%</td>
</tr>
<tr>
<td>Might have negative effect on job</td>
<td>5.4%</td>
</tr>
<tr>
<td>Might cause neighbors/community to have negative opinion</td>
<td>5.1%</td>
</tr>
<tr>
<td>Did not feel need for treatment at the time</td>
<td>3.1%</td>
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www.addictionstudiesinstitute.com