Understanding Addiction: Squirrel Logic

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Addiction

• Lack of ability to control the behavior

• Causes problems in life functioning, social functioning, health or well-being

• Obsession

• Dis-ease when unavailable
Why don’t they just quit?
1. The greatest problem we have working with alcoholics and addicts is our own beliefs and expectations.
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2. The addict is always doing the best he/she can.
A View of Behavior

1. All behavior comes from the brain
Behavior

- Thought
- Emotion
- Senses
- Movement
- Memory
Behavior

- Thought
- Emotion
- Senses
- Movement
- Memory
A View of Behavior

1. All behavior comes from the brain
2. The brain is chemical
A View of Behavior

1. All behavior comes from the brain

2. The brain is chemical

3. Chemistry follows the LAWS of physics/math
So...

IF... All behavior $\rightarrow$ brain AND

The brain is chemical AND

Chemistry follows laws of Mathematics...

THEN: All behavior follows the LAWS of mathematics
THE REWARD SYSTEM
Function of The Reward Pathways

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

- Food
- Water
- Sex
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
The Effects of Alcohol/Drugs on Behavior
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

cocaine
heroin
nicotine

alcohol

heroin
Neurotransmitter Replacement

“The law of no free lunch”
Short Term Effects after Ecstasy is Gone

Normal

During Ecstasy
- elevated mood

After Ecstasy
- depression-like feelings, irritability
Serotonin Present in Cerebral Cortex Neurons

Normal

2 weeks after Ecstasy

7 years after Ecstasy
Normal
SPECT Scan

Healthy

7 year opiate user
SPECT Scan

Healthy

25 year opiate user
Neurotransmitter Imbalances

Imbalances of...  Results in:

Serotonin  Depression/Eating  DO
Dopamine  Schizophrenia
Norepinephrine  Anxiety/Depression
Glutamate  OCD/PTSD
GABA  Anxiety/Panic
Endorphin
Endorphin

Pain
Endorphin ➔ Pain
Endorphin → Pain → Opiate
Endorphin → Opiate → Pain
Endorphin

Pain
Endorphin

Pain
Endorphin

Pain
Endorphin
ADDICTION
Brain Shape (Design)

Factors

1. DNA
2. Oxygen & Nutrients
3. Environment
Cellular Adaptation

Environment Change

Brain Change
Adaptation To Drug

• Consistent drug use is a “new environment” and adaptation occurs

• The reward system is strongly affected

• The drug takes on the properties of the activities that naturally create sensations of pleasure
Definition of Addiction

Addiction is the physical adaptation of the reward pathways of the brain to the repeated presence of dopamine-surging chemicals

(False survival drive)
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*
The Adolescent Brain

• Preteens have “under-developed” prefrontal cortices

• 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
RECOVERY PROCESS

(Now that we know this, what do we do?)
Goals of Treatment

• Cessation and abstinence from all dopamine-surring chemicals
• Empowerment to steer behavior by the prefrontal cortex
• Stabilize & quiet the midbrain
• Become comfortable with not using
Treatment Tasks

Physical Stability

- Sleep
- Balance blood sugar levels
- Exercise
- Relaxation/meditation
Mental/Neural Strengthening

- Develop New Neural Pathways
- Learn Recovery Skills
- Counseling
- Quit Smoking
Environmental Management

– Establish a healthy life space
  • People
  • Places
  • Things
– Immersion into sober activities with sober people
– 12-step activity
<table>
<thead>
<tr>
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<th>Treatment Options</th>
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<tbody>
<tr>
<td>IV</td>
<td>Acute Hospital Detoxification</td>
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<tr>
<td>III-C</td>
<td>Sub-acute Detoxification [24-hour medical monitoring]</td>
</tr>
<tr>
<td>III-B</td>
<td>24 hour Observation Bed</td>
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<tr>
<td>II-B</td>
<td>Residential, Medical [24-hour medical/nursing monitoring]</td>
</tr>
<tr>
<td>II-A</td>
<td>Residential, Non-medical</td>
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Treatment Options

III-A Outpatient/Ambulatory Detoxification

I-B Intensive Outpatient/Partial Hospitalization \[ \geq 8 \text{ hr/week over at least 3 days} \]

1-A Standard Outpatient

Opiate Agonist Program

Medication Assisted Treatment (MAT)
Medication-Assisted vs Opiate Agonist

MAT

• Taper or maintenance
  – Buprenorphine (Subutex, Suboxone)
  – Naltrexone (Depade, Revia)
    • Vivitrol

Opiate Agonist Program

– Methadone
Relapse Rates in First 12 Months

Cigarettes: Low est. 90%
Weight Loss: High est. 80%
Asthma: Low est. 70%
Hypertension: Low est. 70%
Type I Diabetes: Low est. 50%

NIDA, 2012
Relapse Rates in First 12 Months

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- **Drug Addiction**

**NIDA, 2012**
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- Asthma: Low est. 70%, High est. 70%
- Hypertension: Low est. 70%, High est. 70%
- Type I Diabetes: Low est. 50%, High est. 50%
- Drug Addiction: Low est. 60%, High est. 60%

NIDA, 2012