The Disease Model and it’s Implications: Medication and Morality in the Treatment of Addictions

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Addiction: Disease, Disorder or neither? Why?
“No amount of reinforcement or punishment can alter the course of an entirely autonomous biological condition. Imagine bribing an Alzheimer’s patient to keep her dementia from worsening, or threatening to impose a penalty on her if it did.”
ALL HUMAN BEHAVIOR

VOLUNTARY BEHAVIOR

High compulsion

Low compulsion

INVOLUNTARY BEHAVIOR
“Disorder” is “a weaker term than disease n., and not implying structural change.”

-Oxford English Dictionary
The ICD-10 and DSM-IV

1 Certain infectious and parasitic diseases (A00-B99)
2 Neoplasms (C00-D49)
3 Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)
4 Endocrine, nutritional and metabolic diseases (E00-E89)
5 Mental, Behavioral and Neurodevelopmental disorders (F01-F99)
6 Diseases of the nervous system (G00-G99)
7 Diseases of the eye and adnexa (H00-H59)
8 Diseases of the ear and mastoid process (H60-H95)
9 Diseases of the circulatory system (I00-I99)
10 Diseases of the respiratory system (J00-J99)
11 Diseases of the digestive system (K00-K95)
12 Diseases of the skin and subcutaneous tissue (L00-L99)
13 Diseases of the musculoskeletal system and connective tissue (M00-M99)
14 Diseases of the genitourinary system (N00-N99)
The Double Bind

We suggest that the double bind nature of the family situation of a schizophrenic results in placing the child in a position where if he responds to his mother's... affection her anxiety will be aroused and she will punish him... Thus the child is blocked off from intimate and secure associations with his mother. However, if he does not make overtures of affection, she will feel that this means she is not a loving mother and her anxiety will be aroused. Therefore, she will either punish him for withdrawing or make overtures toward the child to insist that he demonstrate that he loves her. The helplessness, fear, exasperation, and rage which a double bind situation provokes in the patient [result in schizophrenia].
10-year MRI follow-up
34-year-old female with chronic schizophrenia

Feb. 1990
1st episode

Feb. 1995
5 years later

Jan. 2000
10 years later
ADDICTION AND THE FAMILY CYCLE

We are proposing that drug addiction can be thought of as part of a cyclical process involving three or more individuals, commonly the addict and his two parents or parent surrogates. These people form an intimate, interdependent, interpersonal system. At times the equilibrium of this interpersonal system is threatened, such as when discord between the parents is amplified to the point of impending separation. When this happens the addict becomes activated, his behavior changes, and he creates a situation that dramatically focuses attention upon himself. This behavior can take a number of forms. For example, he may lose his temper, come home high, commit a serious crime, or overdose on drugs. Whatever its form, however, this action allows the parents to shift focus from their marital conflict to a parental overinvolvement with him. In effect, the movement is from an unstable dyadic interaction (e.g., parents alone) to a more stable triadic interaction (parents and addict). By focusing on the problems of the addict, no matter how severe or life-threatening, the parents choose a course that is apparently safer than dealing with long-
Areas of the brain hyporesponsive in abstinent but previously heroin dependent subjects

Li-ping Fu, Guo-hua Bi, Zhi-tong Zou, Yan Wang, En-mao Ye, Lin Ma, Ming-Fan, Zheng Yang, Impaired response inhibition function in abstinent heroin dependents: An fMRI study, Neuroscience Letters, Volume 438, Issue 3, 27 June 2008, Pages 322-326
“Now that I have an addiction I have no choice, but it was my fault because I used drugs or alcohol in the first place.”
96% or persons with past year drug dependence first used illegal drugs before age 21.

80% used an illegal drug other than marijuana.

National Survey of Drug Use and Health 2010
Top 5 primary illegal drugs for persons age 18-29 entering treatment, %

Heroin or Prescription Opioids are the primary drug of abuse for more than 1 in 4 persons age 18-30 seeking treatment.
Proportion of 18-26 year olds who tried prescription pain killers before the age of 18 by heroin dependence status
Adolescent obesity
Why is it so easy to get addicted to heroin, nicotine, sugar, and fatty foods but so hard to get addicted to broccoli?
Environment of Evolutionary Adaptedness

Pleistocene Era ~ 10,000 BCE

Modern Day
FRONTAL LOBE
Consciousness
Reasoning
Planning
Goals
Values
Sense of Self
Two types of reinforcement

Positive Reinforcement

Negative Reinforcement
Which type of reinforcement is most important in addiction?
Addiction is a disease of the motivational system whereby a person becomes profoundly attached to self-destructive substances and/or behaviors. This maladaptive attachment entails severe dysregulation of positive and negative reinforcement processes that sustain the addictive attachment and disrupt normal attachments and priorities.
# Stages of Heart Disease

<table>
<thead>
<tr>
<th>Class</th>
<th>Functional Capacity</th>
<th>Class</th>
<th>Objective Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Patients with cardiac disease but resulting in no limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.</td>
<td>A</td>
<td>No objective evidence of cardiovascular disease. No symptoms and no limitation in ordinary physical activity.</td>
</tr>
<tr>
<td>II</td>
<td>Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain.</td>
<td>B</td>
<td>Objective evidence of minimal cardiovascular disease. Mild symptoms and slight limitation during ordinary activity. Comfortable at rest.</td>
</tr>
<tr>
<td>III</td>
<td>Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnea or anginal pain.</td>
<td>C</td>
<td>Objective evidence of moderately severe cardiovascular disease. Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfortable only at rest.</td>
</tr>
<tr>
<td>IV</td>
<td>Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort increases.</td>
<td>D</td>
<td>Objective evidence of severe cardiovascular disease. Severe limitations. Experiences symptoms even while at rest.</td>
</tr>
</tbody>
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## Stages of Alcoholism

<table>
<thead>
<tr>
<th>Class</th>
<th>Functional Capacity</th>
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<tr>
<td>I</td>
<td>Persons with a family history of alcoholism who use alcohol habitually below the recommended limit but whose frequency and amount of use is trending upward.</td>
</tr>
<tr>
<td>II</td>
<td>Persons who use alcohol at or above the recommended limit but suffer only mild or infrequent functional limitations as a result.</td>
</tr>
<tr>
<td>III</td>
<td>Persons who use alcohol more frequently or in greater quantity than is recommended and suffer moderate relational, emotional, moral, and/or professional consequences.</td>
</tr>
<tr>
<td>IV</td>
<td>Persons who use alcohol more frequently or in greater quantity than is recommended and suffer severe relational, emotional, moral, and/or professional functional impairment.</td>
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**CDC Recommended Limits**

- ≤ average of 2 drinks per day for men, no more than 5 on any occasion
- ≤ average of 1 drink per day for women, no more than 4 on any occasion
Case #1: Joe is a 45-year-old man and daily drinker. In the past few years, his daily consumption has increased from 2 or 3 drinks per night to 4 or 5 drinks per night. Somewhere in this transition, his wife has started expressing concern about his alcohol consumption. Now he attempts to get home and have a couple beers before his wife arrives. He has a couple more when she is home but pretends that these are his only drinks for the night. Tonight, however, is their son’s first little league game. Joe is giving a presentation at work that will prevent him from leaving early. It’s his job to pick up his son and take him to the game where his wife will meet them. Three options present themselves to Joe:

A. Tell his wife he has gotten sick and has to go home, leaving him to drink while she attends the son’s game.
B. Have few drinks on the way to the game (this will force him to drink quickly and drive his son under the influence of alcohol).
C. Tough it out and either drink fewer beers than normal or face his wife’s criticism when he quickly downs four beers before bed.

Joe feels ashamed that he is considering an act of deception and that he would even consider missing his son’s first baseball game. He therefore chooses option “c.” At the game he is distracted and more than once wanders to the snack bar wishing it served beer. When he gets home, he has two beers and goes to bed.
Medication Assisted Treatment
I NEED TO USE !!!!!!!!!!

Host of rationalizations

CRAVING

FRONTAL LOBE
Consciousness
Reasoning
Planning
Goals
Values
Sense of Self
I NEED TO USE !!!!!!!!!!!

Host of rationalizations

CRAVING
Rock Bottom

DRIVE

SURVIVE

Recovery
Pharmacocolocial Drive Reduction
Four Neurotransmitters affected by chronic alcohol use

GABA – γ-aminobutyric acid
Glutamate
Endorphins (opioids)
Seratonin
Non-addictive medications that aid in the treatment of alcohol dependence

**FDA-approved for alcohol dependence**

- Acamprosate (Campral®)
- Naltrexone oral and depot (Vivitrol®)
- Disulfiram (Antabuse®)

**Depression and Anxiety**

- SSRI’s and SNRI’s
GABA and Glutamate
Downregulation of GABA receptors
The brain’s neurons become insensitive to GABA
Upregulation of Glutamate receptors
The brain’s neurons become hypersensitive to glutamate.
Some symptoms of alcohol withdrawal

Anxiety and Nervousness

Irritability

Jumpiness or shakiness

Tremors

Rapid heart rate

Sweating

Seizures
Acamprosate (Campral®)

Helps to stabilize the glutamate / GABA imbalance by subtly inhibiting glutamate activity
Abstinent at 60 days

Abstinent at 48 weeks

Acamprosate

A non-addictive medication that costs about $4.50 / day and is covered by most Insurance companies.
Alcohol use causes a rush of our endogenous opioids (endorphins), resulting in:

- Analgesic effects
- A dopamine “high”
- Behavioral reinforcement
Genetic differences

Persons with family history of alcoholism

- Lower baseline levels of β-endorphins
- Greater release of β-endorphins after exposure to alcohol

Naltrexone

- Blocks the endorphin rush and the consequent dopamine “high”
- Reduces cravings caused by euphoric recall
**NALTREXONE** causes an observable reduction of activity in the midbrain when an alcohol dependent subject is presented visual cues.

Hugh Myrick; Raymond F. Anton; Xingbao Li; Scott Henderson; Patrick K. Randall; Konstantin Voronin. **Effect of Naltrexone and Ondansetron on Alcohol Cue-Induced Activation of the Ventral Striatum in Alcohol-Dependent People.** Arch Gen Psychiatry. 2008;65(4):466-475.
NALTREXONE reduces clients’ subjective craving for alcohol making it easier to stop drinking.

By reducing cravings, **NALTREXONE** contributes significantly to relapse prevention efforts.

Alcohol relapse: cumulative abstinence duration (CAD) by Treatment Group.
Disulfiram

By blocking the breakdown of acetaldehyde, alcohol disulfiram causes the symptoms of a “hangover,” including:

- Increased heart rate
- Shortness of breath
- Nausea and vomiting
- Throbbing headache
REWARD PROCESSING
STRESS RESPONSE
EMOTION
MEMORY
SICKNESS

ARCA
ASSISTED RECOVERY CENTERS OF AMERICA

REWARD PROCESSING
STRESS RESPONSE
EMOTION
MEMORY
Grams of ethanol per week

Medication Assisted Treatment for Opioid Dependence
Prior treatment episodes for persons starting treatment for heroin dependence, 2009

SAMHSA (2009) Treatment Episodes Data Set.
Medications of Opioid Addiction

Methadone - agonist
Suboxone – partial agonist
Naltrexone – antagonist
Vivitrol – 28-day injection of naltrexone
History of MAT for heroin dependence

1919 The Harrison Act and its interpretation
1929 Congress establishes “narcotics hospitals” at Lexington and Fort Worth
  - over 90% relapse rate
1964 Mary Nyswander and Vincent Dole experiment with methadone
Primary virtues of Methadone

• Long-acting so that with a daily dose, a steady state of active opioids can be achieved
• Eliminates or severely reduces opioid craving
• At proper doses, it can create an opioid blockade through cross-tolerance
• People with opioid addiction can focus on the rest of their lives
2002 Buprenorphine (Suboxone®/Subutex®)

• Long-acting so that with a daily dose, a steady state of active opioids can be achieved
• Eliminates or severely reduces opioid craving
• At proper doses, it can create an opioid blockade through antagonist effect
• A ceiling effect makes buprenorphine safer than methadone in preventing respiratory depression
Heroin Addiction

INTOXICATION

WITHDRAWAL
Buprenorphine or Methadone Maintenance
Isn’t using methadone just a replacement for using heroin?
Cycle of Addiction

DRUG USE
- PHYSICAL RELIEF
- GUILT / SHAME
- RECALL OF CONSEQUENCES
- RECALL OF GOOD INTENTIONS
- FEELING OF HELPLESSNESS

LOSS OF CONTROL
- LOSS OF COGNITIVE CONTROL
- COMPROMISED VALUES
- COMPROMISED INTENTIONS
- AMNESIA RE: CONSEQUENCES
- RATIONALIZATION OF USE

CRAVING
- PANICKED DRUG-SEEKING
- LYING, CHEATING, STEALING

WITHDRAWAL
- DECREASING WELL-BEING
- INCREASING STRESS
- MENTAL OBSESSION

ARCA
ASSISTED RECOVERY CENTERS OF AMERICA
Methadone Maintenance reduces crime

The Effectiveness of Methadone Maintenance Treatment (p. 182), by J. C. Ball and A. Ross, 1991, New York: Springer-Verlag.
SUBOXONE facilitates client engagement by reducing cravings and preventing withdrawal

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<td>1950’s</td>
<td>Abraham Wikler observes the phenomenon of “conditioned withdrawal”</td>
</tr>
<tr>
<td>1960’s</td>
<td>Experiments with antagonist therapy - cyclazocine</td>
</tr>
<tr>
<td>1971</td>
<td>President Nixon creates the Special Action Office for Drug Abuse Prevention</td>
</tr>
<tr>
<td>1972</td>
<td>Congress puts aside money to research non-addictive anti-craving medications</td>
</tr>
<tr>
<td>1984</td>
<td>FDA approves naltrexone for opioid dependence</td>
</tr>
<tr>
<td>2010</td>
<td>FDA approves 28-depot naltrexone (Vivitrol®) for opioid dependence</td>
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</table>
Naltrexone and Vivitrol® prevents intoxication and reinforcement of opioids without causing physical dependence
VIVITROL reduces client cravings, prevents reactivation of addiction and leads to improved treatment retention.

(All participants received twice weekly relapse prevention therapy)

% Opioid free weeks in 6 months

Limitations of Vivitrol®

- No natural reward
- Compliance is based entirely on internal motivation
- Risk of overdose after medication is discontinued
- Client must be completely opioid free prior to naltrexone induction
Which is the best medication?

As with any chronic disease or disorder, the correct medication depends on the characteristics of the patient as well as their stage of recovery.
Motivation

- METHADONE
  - Strongest drug reward
  - Highest level of accountability

- SUBOXONE
  - Moderate drug reward
  - Moderate level of accountability

- VIVITROL
  - No drug reward
  - Moderate level of accountability
Principles of Individualized MAT

1. Educate regarding options.
3. Provide a clinical opinion
4. Support client in developing a treatment plan with concrete goals.
Lifelong Diabetes Relapse Prevention

- Regular doctor's visits
- Monitor blood glucose levels
- Plan meals carefully
- Exercise / sleep regularly
- Monitor “red flag” symptoms (deterioration of vision, circulation)
- Treat related physical problems
- Take prescribed medication
Lifelong **Addiction** Relapse Prevention

- Regular support groups
- Monitor emotional well-being
- Avoid high risk situations
- Exercise / sleep regularly
- Monitor “red flag” symptoms (cognitive distortions, isolation)
- Treat related psychological problems
- Take prescribed medication
How Long Should a Person Stay on Medication for the treatment of opioid dependence?

Incentive Sensitization and the case of Maria or Mario
Dopamine

STRESS - HPA

REWARD – MLC

Corticosterone releasing hormone (CRF)

EMOTION
MEMORY
STRESS RESPONSE
REWARD PROCESSING
REASONING
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