HOW TO UNDERSTAND THE DISEASE OF ADDICTION

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When discussing any conceptual or theoretical model, it is important to remember the adage of British statistician George Box, Ph.D. (1953, Mathematics Genealogy, University of London) who wrote the famous line: "All models are wrong; some are useful" (1976, p. 972). His point was that we should focus more on whether something can be applied to everyday life in a useful manner rather than debating endlessly whether an answer is correct in all cases.

The inspiration for this article came from a comment made by someone, with two younger siblings in late stage chronic alcoholism, who made the following authoritative pronouncement: "Well, I disagree with the American Medical Association that alcoholism is a disease. If a person drinks too much, they just need to stop." In defense of the bright and well-educated professional who made this comment, it should be acknowledged that the person was neither alcoholic nor trained in medicine, psychiatry, or psychopharmacology.

It's not only the American Medical Association, but a variety of national and international professional organizations view addiction as a disease. These organizations include the following:

American Psychiatric Association
American Hospital Association
American College of Physicians
American Public Health Association
American Society of Addiction Medicine
National Association of Social Workers
National Institute on Alcohol Abuse and Alcoholism
World Health Organization

Definition of a Disease

Merriam-Webster's dictionary provides the following definition of *disease*: "a condition of the living animal or plant body or of one of its parts that impairs normal functioning and is typically manifested by distinguishing signs and symptoms." Since 1956, the American Medical Association (AMA) has defined addiction as a primary disease; that is, one that is not caused by any other disorder. The following AMA guidelines define disease: (1) an impairment of the normal functioning of some aspect of the body, (2) characteristic signs or symptoms, and (3) harm or morbidity. By 1991, the AMA had endorsed the dual classification of alcoholism contained in both the psychiatric and medical sections of the World Health Organization's *International Classification of Diseases*.

This definition of Addiction is provided by the American Society of Addiction Medicine (ASAM; 2019, p. 2):

"Addiction is a treatable, chronic medical disease involving complex interactions among brain circuits, genetics, the environment, and an individual's life experiences. People with addiction use substances or engage in behaviors that become compulsive and often continue despite harmful consequences.

Prevention efforts and treatment approaches for addiction are generally as successful as those for other chronic diseases" (ASAM, 2019, p. 2).

Defining Characteristics of a Disease

Perhaps the easiest way to define an entity such as a disease is to use the Duck Test.[1] A criterion-referenced way of defining a disease is to determine whether the entity meets all of the criteria that define a disease. A *disease* has several defining characteristics: etiology, phenomenology, dysfunction, course, treatment, prognosis, and outcome. Comparisons are often made with other chronic diseases—asthma, Type 2 diabetes, and hypertension—in which heritability, etiology, personal choice, pathophysiology, and treatment response (adherence and relapse) play major roles in course and prognosis. A review of the literature is revealing: "Genetic heritability, personal choice, and environmental factors are comparably involved in the etiology and course of all of these disorders. Drug dependence produces significant and lasting changes in brain chemistry and function" (McLellan et al., 2000, p. 1695).

The defining characteristics of any disease are described below:

Etiology refers to origin or causal factors, which includes ***internal factors*** (e.g., genetic, epigenetic, prenatal, developmental, synaptic, neuroplastic) and ***external factors*** (e.g., prenatal environmental, familial, social, cultural, behavioral).

Phenomenology includes ***symptoms*** (i.e., distress experienced and reported by a patient) and *signs* (i.e., observations or inferences made by the clinician or others).

Dysfunction (impairment in functioning) includes ***severity*** specifiers (i.e., subclinical, mild, moderate, severe, profound, and terminal).

Course over a period of time includes descriptors such as ***longitudinal course*** specifiers (e.g., progressive, episodic, variable, chronic). For those who are abstinent, there are also remission specifiers such as "early" (≥ 3 months but <12 months) and "sustained" (≥12 months) without symptoms (except craving).

Treatment can include various approaches ranging from ***abstinence-based*** treatment for addiction and alcoholism to ***controlled use*** or moderation management for problematic use that does not involve tolerance or withdrawal. Component treatment includes biological, behavioral, cognitive, psychological, psychosocial, pharmacological, and environmental variables.

Prognosis of a disease can include various ***outcomes*** (e.g., excellent, good, fair, guarded, poor).

Age of onset of drinking is a significant factor in terms of the development of addiction, because the risk of addiction when exposed to addictive substances is greatest for a developing brain (i.e., in which full myelination of the pre-frontal lobes has not been completed). Teens who start drinking by age 13 have a 43% chance of becoming alcoholics, whereas those who start drinking at age 21 have only a 10% chance (Genetic Science Learning Center, 2013).

Biaxial Model of Addiction

Based in part on Griffith Edwards' biaxial model of addiction (Edwards & Gross, 1976), I have developed and used a biaxial model of intervention. This individualized approach, with problem severity being one of the most important variables, has been described as a clinically and ethically informed approach (L. Sobell, personal communication, May 10, 2019).

In my Addictions Class Diagram, depicted in Figure 1 (Doverspike, 2011, p. 97), I expanded and modified Griffith Edwards' model to illustrate (1) a horizontal or longitudinal axis of *dependence* (i.e., tolerance changes and/or predictable withdrawal symptoms upon cessation of use) that may progress over time, and (2) a vertical axis of *problems* (i.e., maladaptive consequences). When neither of these axes or dimensions reaches clinical significance, then there is no diagnosis. When both dimensions increase to a clinically significant level, then there is addiction.

The biaxial model depicted in Figure 1 reflects four possible outcomes of alcohol or other substance use:

Use occurs when there are no maladaptive consequences/problems and no dependence, tolerance, or withdrawal symptoms.

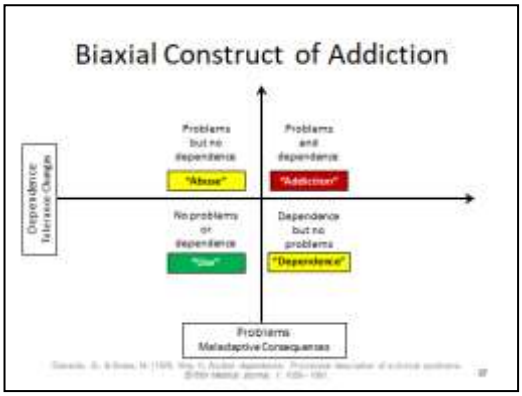
Abuse occurs when there are maladaptive consequences/problems but no dependence, tolerance, or withdrawal symptoms.

Dependence occurs when there are no maladaptive consequences/problems but when there are dependence, tolerance, or withdrawal symptoms.

Addiction occurs when there are maladaptive consequences/problems and when there are dependence, tolerance, or withdrawal symptoms.

Depending on internal and external etiological factors, continued use, abuse, and dependence can eventually—but not necessarily—lead to addiction. It is this condition—addiction or alcoholism—that meets all of the hallmark criteria of a disease. Alcohol use, abuse, and dependence can exist without progression, although any of these conditions can eventually lead to an outcome of alcoholism.

Figure 1.
Biaxial Construct of Addiction

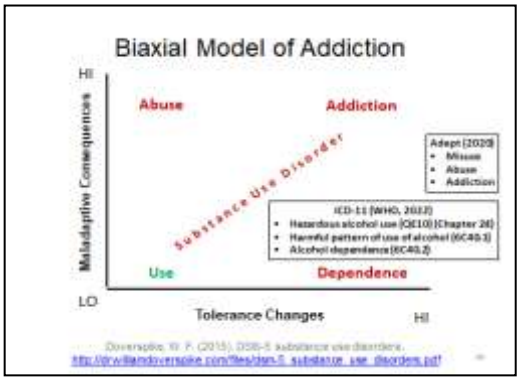


Adapted from Doverspike (2011, Slide 97)

Regarding the distinction between addiction and dependence, Charles O'Brien, M.D., of the University of Pennsylvania and Nora Volkow, M.D., Director of the National Institute on Drug Abuse (NIDA), have stated that the American Psychiatric Association (APA) committee responsible for revising the *DSM-III* in the 1980s favored the term "dependence" over "addiction" by a single vote. Since that time, O'Brien, Volkow, and other psychiatrists have argued that the *DSM* conflates addiction and dependence (O'Brien & Volkow, 2006). The current DSM-5-TR (APA, 2022) continues to conflate these two constructs. In contrast, the World Health Organization's (2022) *International Classification of Diseases, 11th Revision* (ICD-11) maintains the important distinctions among hazardous use, harmful use, and dependence. Figure 2 (Doverspike, 2011, p. 98) illustrates some of these distinctions (e.g., with alcohol).

Figure 2.

Conflation of Abuse, Dependence, and Addiction



Adapted from Doverspike (2011, Slide 98)

Notes

1. The Turing Duck Test is an assay developed by Alan Turing (1912–1954), the English mathematician who is widely considered to be the father of theoretical computer science. Turing's procedure was to determine whether a subject was a man or a robot. He devised dozens of experiments to determine whether people were, in fact, human beings. While the Turing Duck Test was rarely employed, it gave rise to the often misattributed hypothesis: "If it walks like a duck, and it quacks like a duck, it's a duck."

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George Edward Pelham Box (1919-2013) earned a doctorate in Mathematics at the University of London in 1953. He was a Fellow of the Royal Society (FRS) and a British statistician who worked in the areas of quality control, time-series analysis, design of experiments, and Bayesian inference. He has been called one of the great statistical minds of the 20th century.

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This slide deck is one of several presentations that I have used in my private seminars and when teaching the Substance Use Disorders section in graduate courses of Psychopathology (2005–2021) and Addictions Counseling (2011–2021) at Richmont Graduate University in Atlanta, Georgia.

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