Understanding the Disease of Addiction

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The disease of chemical dependency can be traced to neural pathways in the brain predating a diagnosis of addiction. A genetic predisposition alone is not enough to predict addiction. Typically, psychological and social influences drive the person to use the addicting substances, and the combination of genetic predisposition and these influences triggers the disease. Chemically dependent nurses are susceptible to the scrutiny of boards of authority if their addiction affects the workplace. Therefore, those in authority should understand the disease of addiction and use an effective, compassionate approach that will benefit both the addicted nurse and nursing as a whole.

Learning Objectives
- Define addiction, substance abuse, and substance dependence.
- Identify contributing factors for addiction.
- Explain the biological neural pathways that underlie addiction.

The concept of alcoholism and other drug dependency as being a disease first surfaced early in the 19th century. In 1956, the American Medical Association (AMA) declared alcoholism an illness, and in 1987, the AMA and other medical organizations officially termed addiction a disease (Leshner, 1997). The American Nurses Association estimates that 6% to 8% of nurses have alcohol or drug abuse problems serious enough to impair their judgment, meaning that the disease of addiction profoundly affects the nursing profession.

The following description of the disease of addiction has utility when trying to understand the mechanisms responsible for the processes that occur under the direct influence of substances or addicting behaviors and for a period of time afterwards. The phenomenon of craving in some can also be at least partly attributed to these neurophysiologic mechanisms. Under the direct influence of the disease, the addict is in an altered state of consciousness, one that is now measurable with the newer imaging techniques. There are advantages for the nursing and medical community to understand these mechanisms, so the proper specialized approaches to addiction can be implemented. The status of “disease” can also assist with the necessary coverage for treatment, giving addiction its rightful parity with other diseases in psychiatry and medicine.

Not everyone accepts addiction as a disease. Some still view it as a moral failure or lack of will power. Many nurses remain silent about their addiction to mood-altering substances for a number of reasons. The most important reason is denial (Morse & Flavin, 1992). Addicted nurses also experience shame and guilt that drive the addiction underground. They do not intentionally jeopardize the safety and well-being of their patients or themselves; in fact, the workplace is often the last place the signs and symptoms of addiction become obvious. Thus, overt signs and symptoms in the workplace usually mean the disease has already progressed (Angres, Talbott, & Bettinardi-Angres, 2001) (see Table 1).

Understanding the biological mechanisms that underlie addiction can help others recognize and treat the problem with more empathy, less stigmatization, and more effective outcomes. Alcohol and drug addiction are primary, chronic, progressive, and often fatal health problems for all of society, not just the medical and nursing community.

Defining Addiction

Addiction is defined as the ongoing use of mood-altering substances, such as alcohol and drugs, despite adverse consequences. Genetic, psychosocial, and environmental factors influence the development and manifestations of the disease (Morse & Flavin, 1992). Characteristics of alcoholism include continuous or periodic impaired control over drinking, preoccupation with alcohol, use of alcohol despite adverse consequences, and distortions in thinking—most notably denial. To the brain, alcoholism and drug addiction are the same.

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) defines substance abuse and dependence as a maladaptive pattern of substance use, leading to clinically significant impairment or distress, although they are manifested differently.

Substance dependence is defined and manifested by three or more of the following occurring at any time in the same 12-month period:
- A need for markedly increased amounts of the substance to achieve intoxication or desired effects
- A markedly diminished effect with continued use of the same amount of the substance
- The characteristic withdrawal syndrome for the substance
Causes of Addiction
A percentage of the population has a biogenetic predisposition to chemical or addictive behaviors; however, early-life traumatic experiences, such as isolation or abuse, can contribute to a pre-disposition to addiction. A predisposition alone is generally not enough to cause the disease. Often, a person is influenced by social factors, such as peers and societal and familial norms, and psychological issues, such as a history of physical or sexual abuse, other trauma, and dual diagnosis.

Nurses at Risk
The risk to nurses is the same as it is for the general population, except for one thing: Nurses have better access to opiates. This accessibility, coupled with the culture of relieving pain with mood-altering substances, can create an ideal environment for a person who is genetically predisposed to addiction. Thus, nurses with a significant family history of addiction should either abstain from working with opiates or have an awareness of the potential for danger and incorporate stress-reducing behaviors into their lifestyle as a prevention. Currently, no one can predict if a person will become addicted in his or her lifetime.

Reward Circuitry of the Brain
The mesolimbic pathways connect the brainstem and peripheral nervous system responsible for automatic body functions, and the limbic areas of the brain responsible for emotions to the prefrontal cortex, where thinking and decision making take place. Intellectually, people know that happiness does not come in a bottle, pill, or morsel. Unfortunately, the brain’s reward circuitry does not know it. In fact, what underlies addiction is reward (see Figure 1)

Reward is the term neuroscience uses to describe experiences that bear repeating, such as pleasure or relief from some discomfort. Neuroscience has come a long way in identifying the areas of the brain involved in reward and the neurochemistry of our feel-good chemicals that create reward responses. Neurotransmitters, such as dopamine and beta-endorphins, facilitate communication to the reward center. In the addict, the pathway involved in essential behaviors, such as eating, sleeping, and sex, is hijacked. The addict’s initial motivation is to feel pleasure. Eventually, the reward pathway shifts its sensitivities to the substance or behavior instead of the neurotransmitters. In other words, the brain begins to depend on outside chemicals for reward.

Motivation
Motivation is another factor with biological components, and pursuit of goals that produce desired outcomes is an integral aspect of addiction and recovery. Kalivas and Volkow (2005) support the theory that addiction involves a dysregulation in the motive circuitry, and the repetitive use of addictive drugs reorganizes brain circuitry to establish behaviors characteristic of addiction. MRI studies on cue-induced craving demonstrate increased reaction between the amygdala, the fear-based part of the brain, and the prefrontal cortex when people are actively reminded of their addicting agent. The prefrontal cortex, responsible for decision making, gets activated with the amygdala, creating a connection for craving. This activates a neurotransmitter called glutamate, which creates an unpleasant feeling associated with craving that can cause the addict to try to reduce this discomfort through drug use. Besides the legal, financial, and psychosocial consequences of addictive behavior, the addict also risks neuronal recircuiting that results in physiologic cycles of addictive behaviors. These circuits are increasingly difficult to break.

Decision Making
Addictive behaviors negatively affect decision making, as well. Noel, van der Linden, and Bechara (2006) suggest that addiction is an imbalance between the neural system that is reactive for signaling pain or pleasure and another neural system that is reflective and controls the reactive system. When the ventro-medial prefrontal cortex (VMPC) is injured in nonaddicts, they make detrimental decisions and fail to learn from their mistakes, contrary to their pre-injury personality. The authors make striking comparisons between patients with VMPC injuries and addicts. Both deny they have a problem and appear to ignore the consequences of their actions. In addiction, the neural mechanisms that enable people to reflect and choose wisely appear to be weakened, and
addicts move from self-directed behavior to automatic sensory-driven behavior. The study's authors hypothesize that some people have a weak decision-making mechanism in the brain and that the weakness makes them vulnerable to addiction. The source of the weakness can be genetic or environmentally induced.

Recent MRI studies demonstrate a split between the ability to make appropriate decisions as the compulsive drive for the chemical or addiction progresses. Goldstein and Volkow (2002) demonstrated that as addiction progresses, one’s ability to make appropriate choices diminishes. Increased impulsivity is accompanied by memories of when the addiction worked as well as negating options other than engaging in the addiction. Not only are some people predisposed to a sluggish reward circuitry before ever using a substance, they also appear to have some degree of difficulty in decision making. Deficits in these areas constitute the vicious circle of addiction.

Denial, the close companion of addiction, feeds off the progressive deterioration of the ability to freely choose. Denial is reinforced by the powerful reward of the addiction and the deficits in learning, motivation, memory, and decision making.

Conclusion

Addiction is a biopsychosocial disease process, not a choice. Mar-tha Morrison, MD, in her book White Rabbit, stated that she grew up wanting to be a physician, not a drug addict. Alcoholic and addicted nurses unanimously report the same sentiments.

If appropriately treated, addiction can remain in remission, and nurses who have peer support and monitoring have a greater chance of long-term sobriety than the general population. The recovering addict must begin an exploration into self, cultivate a program of well-being, and maintain a long-term goal of sobriety.

The bodies of authority in the nursing profession must understand the disease of addiction and its treatment. This understanding may lead to more options for addicted nurses, greater opportunities for them to heal and return to the profession, and a compassionate approach to peers that is congruent with the values of the nursing profession.