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**Dalgarno Institute:  
Research Report  
(DRR)**

**Dealing with  
Addiction**

**Models, Modes, Mantras & Mandates – A Review of  
Literature Investigating Models of Addiction  
Management.**

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## Introduction:

Over the last 100 years, scientists studying drug abuse worked on the pretext about the nature of addiction. When scientists began to study addictive behaviour in the 1930s, people addicted to drugs were thought to be morally flawed and lacking in willpower. Those views shaped society's responses to drug abuse, treating it as a moral failing rather than a health problem, which led to an emphasis on punishment rather than prevention and treatment. (Volkow, 2014)

Viewing addiction to alcohol as a behavioural problem, programs like Alcoholics Anonymous (AA), applying counselling and 12 principles for living a life free of addiction emerged. While these psychologically designed programs have been a necessary part of a successful recovery program, these approaches alone have not been shown to be very effective. For example, studies have shown that AA has a success rate of around 25 percent (Larson et al, 1992). Unfortunately, these efforts often address the psychological aspects of the disease without considering the physical aspects of the disease.

Today, thanks to science, our views and our responses to addiction and other substance use disorders have changed dramatically. Groundbreaking discoveries about the brain have revolutionized our understanding of compulsive drug use, enabling more effective responses to the problem. As a result of scientific research, we know that addiction affects both the brain and behaviour. And as this research paper will uncover, the interplay of behaviour on brain, not just brain on behaviour, is much more influential than previously understood.



**“WHAT IS ADDICTION; A DISEASE, OR DIS-EASE, OR DISORDER, OR DYSFUNCTIONAL BEHAVIOUR?”**

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*“The brain disease model is the most prevalent model of addiction in the western world. Particularly in the United States, it dominates professional and public discourse on prevention, treatment, research agendas, and policy issues... but the narrow focus of the disease model on the neurobiologic substrates of addiction has diverted attention (and research funding) from other models... But are the neurocognitive processes that give rise to addiction actually pathologic, or are they constituents of normal learning with detrimental consequences?” (Lewis 2018)*

Researchers have identified many of the biological and environmental factors and are beginning to search for the genetic variations that contribute to the development and progression of the disease. Scientists use this knowledge to develop effective prevention and treatment approaches that reduce the toll drug abuse takes on individuals, families, and communities.

Research has shown that a majority of addicts suffer from some of the following biochemical, nutritional, and metabolic disorders:

- Depleted or malfunctioning brain chemicals called neurotransmitters.
- Hypoglycemia, or low blood sugar, that causes a wide range of symptoms like anxiety, fatigue, depression and panic attacks, as well as poor adrenal function.
- Digestive problems such as the overgrowth of yeast, Leaky Gut Syndrome, and the malabsorption of nutrients.

- Food allergies or sensitivities to common foods such as corn, wheat, sugar, and dairy products.
- Nutritional deficiencies of key amino acids, vitamins (e.g., B-complex and vitamin C), and minerals (e.g., zinc, magnesium, and calcium).

There is benefit in addressing such disorders in order for people to truly experience the freedom and ability to choose addiction-free living (Finnegan, 1989)

As Dr. Charles Gant surmised after working as the physician and psychiatric consultant for the New York State prison system and dealing with hundreds of drug users and traffickers serving prison terms: “Unless the biochemical imbalances which are the true causes of substance problems are corrected, the benefits of psychological counseling will be marginal for most people.” (Gant 2002)

Despite these advances, and many emerging concepts, many people today do not still wrestle in their understanding of why people become addicted to drugs or how drugs change the brain to foster compulsive drug use.

One prominent and heavily subscribed to model is to describe/label addiction as a “brain disease” has the potential for people to take a “victim” approach, and for addicts to be fatalistic about the “medical disease” they are suffering from. It increases the likelihood of overlooking the importance of personal decision making in managing the situation and overcoming addiction through seeking appropriate treatments and/or counselling programs.

*Yet the disease definition can replace one kind of stigma with another. The notion of a mental illness or disease can hurt more than help those with behavioral problems such as addiction, because it fuels discrimination and alienation of another sort. The disease designation can reinforce the belief that an inviolable or essentialist “badness” is built in and permanent, resulting in a sense that one is fundamentally different from “normal” people, with concomitant feelings of inferiority and shame*

*The label can also curtail attempts to improve one’s functioning without medical care. Biogenetic explanations carry the implication that people with addictions are not really trustworthy, now or in the future, because of a biologic proclivity they cannot control Not only does this fuel one kind of stigmatization; it also helps rationalize a long-standing policy of withholding employment benefits and positions of authority from anyone who has ever been labeled an addict. (Lewis 2018)*

So, labelled ‘Non-Communicable Diseases’ such as Type 2 diabetes and Drug Use Disorders are ‘contracted’ (again, misappropriation of nomenclature) via behavioural processes linked, almost invariably to choice. The evidence that is emerging that is outside the ‘disease model’ framework is



***IT IS DIFFICULT TO ESCAPE THE CONCLUSION THAT AMONG THOSE AT WORK IN OUR GOVERNMENTS AND AOD SERVICES THERE IS LITTLE FAITH IN ADDICTION AS A UNITARY COHERENT PHENOMENON THAT CAN BE READILY ADDRESSED BY DEDICATED NARROWLY CONCEIVED RESPONSES, YET THIS IDEA CONTINUES TO BE PROMULGATED BECAUSE STRATEGIC ALTERNATIVES ARE ABSENT. FROM WHERE MIGHT THESE ALTERNATIVES EMERGE?”***

Suzanne Fraser

demonstrating that conditions of and around addiction can also be reversed/changed through the same mechanism of behaviour/environment change and choice. The best epidemiological approach to these conditions, are proscriptions and prescriptions that empower, equip, and enable behavioural change. Chemical interventions may serve as a 'circuit breaker' at initial stages, but these too should only be employed to empower, enable and equip change of behaviour, and can never be a substitute for behaviour change. Medically Assisted Treatments that undermine and sabotage proactive and protective changes do not add to the candidate's capacity to improve overall health, only at best managing a symptom, with another chemical that further detracts from better health outcomes.

Again, citing Marc Lewis' work:

*If, replacing the disease nomenclature with an emphasis on motivation and self-direction increases the probability of successful outcomes, then treatment professionals (including doctors) should advise those seeking help that they do not have a chronic disease. They should encourage people with addiction not to strive for obedience to a set of rules or pharmaceutical...but instead to seek counseling or psychotherapy to help them organize and modify their own attentional and motivational habits. (Lewis 2018)*

In speaking against a Bill before the US Congress in 2007, Satel and Lilienfield argued that the brain disease concept is bad for the public's mental health literacy stating:

“Characterizing addiction as a brain disease misappropriates language more properly used to describe conditions such as multiple sclerosis or schizophrenia—afflictions that are neither brought on by sufferers themselves nor modifiable by their desire to be well. Also, the brain disease rhetoric is fatalistic, implying that users can never fully free themselves of their drug or alcohol problems. Finally, and most important, it threatens to obscure the vast role personal agency plays in perpetuating the cycle of use and relapse to drugs and alcohol.” (Satel and Lilienfield, 2007)

They explained how addicts rarely spend all of their time in the throes of an intense neurochemical siege. In the days between binges, cocaine addicts make many decisions that have nothing to do with drug-seeking. There is room for other choices for people addicted to drugs. They could go to a Narcotics Anonymous (NA) meeting, enter treatment if they have private insurance, or register at a public clinic if they don't.

“Self-governance, in fact, is key to the most promising treatments for addiction. For example, relapse prevention therapy helps patients identify cues—often people, places, and things—that reliably trigger a burst of desire to use. Patients rehearse strategies for avoiding the cues if they possibly can and managing the craving when they cannot.” (Satel and Lilienfield, 2007)

## **Real Diseases versus The Disease Concept or Theory of Drug Addiction: Why Addiction may well not be a brain disease.**

In a true disease, some part of the body is in a state of abnormal physiological functioning, and this causes the undesirable symptoms. In the case of cancer, it would be mutated cells which we point to as evidence of a physiological abnormality, in diabetes we can point to low insulin production or cells which fail to use insulin properly as the physiological abnormality which create the harmful symptoms. If a person has either of these diseases, they cannot directly choose to stop their symptoms or directly choose to stop the abnormal physiological functioning which creates the symptoms.

They can only choose to stop the physiological abnormality indirectly, by the application of medical treatment, and in the case of diabetes, dietetic measures may also indirectly halt the symptoms as well (but such measures are not a cure so much as a lifestyle adjustment necessitated by permanent physiological malfunction).

Scientific advances over the last quarter century have established the idea that drug addiction is a chronic brain disease (Leshner, 1997). Key evidence for this view consists of images of people's brains taken during or following drug exposures. Brain imaging studies have provided information on the neurobiological effects of drugs, helped explain the causes and mechanisms of vulnerability to drug abuse, and yielded important insights into abusers' subjective experiences and behaviours, including their struggles in recovery.

More specifically, in drug addiction, the dopamine system is altered so that only the substance of choice is capable of triggering dopamine release to the *nucleus accumbens* (NAC), also referred to as the *ventral striatum*, while other potential rewards do so less and less. The NAC is responsible for goal-directed behaviour and for the motivation to pursue goals.

Different theories propose different roles for dopamine in the NAC. For some, dopamine means *pleasure*. If only drugs or alcohol can give you pleasure, then of course you will continue to take them. For others, dopamine means *attraction* which turns to *craving* when the goal is not immediately available. But pretty much all the major theories agree that dopamine metabolism is altered by addiction, and that's a key criterion in this line of thought for determining the label of a disease.

There is a degree of accuracy, again depending on the modelling lens you use to define.-It accounts for the neurobiology of addiction better than the "choice" model and other contenders. It is one explanation for the helplessness addicts feel: they are in the grip of a disease, and so they can't *get better* by themselves. It also helps alleviate guilt, shame, and blame, and it gets people on track to seek treatment. Rather, addiction, like romantic love and other emotionally loaded habits, develops through deep learning and limited alternatives. (Lewis, 2015) Moreover, addiction is indeed like a disease, and a good metaphor and a good model may not be so different.

What it doesn't explain is spontaneous recovery. True, you get spontaneous recovery with medical diseases...but not very often, especially with serious ones. Yet many if not most addicts get better by themselves, without medically prescribed treatment, without going to AA or NA, and often after leaving inadequate treatment programs and getting more creative with their personal issues.

### **The problem with the *disease model* from a brain's-eye view.**

According to Kolb and Wishaw, in reference to neuroplasticity, their undergraduate text states:

"Although we tend to think of regions of the brain as having fixed functions, the brain is plastic: neural tissue has the capacity to adapt to the world by changing how its functions are organized...the connections among neurons in a given functional system are constantly changing in response to experience." (Kolb B. & Whishaw I. 2011)

To get a bit more specific, *every* experience that has potent emotional content changes the *nucleus accumbens* (NAC) and its uptake of dopamine. Yet we wouldn't want to call the excitement you get from the love of your life, or your fifth visit to Paris, a disease. The NAC is highly plastic. It has to be, so that we can pursue different rewards as we develop, right through childhood to the rest of the lifespan.

In fact, each highly rewarding experience builds its own network of synapses in and around the NAC, and that network sends a signal to the midbrain: I'm anticipating x, so send up some dopamine, right now! That's the case with romantic love, Paris, and heroin. During and after each of these experiences, that network of synapses gets strengthened: so the "specialization" of dopamine uptake is further increased. London just doesn't do it for you anymore. It's got to be Paris. Pot, wine, music...they don't turn your crank so much; but cocaine sure does. Physical changes in the brain are its only way to learn, to remember, and to develop. But we wouldn't want to call *learning* a disease.

Marc Lewis, a neuroscientist and recently retired professor of developmental psychology queries whether the disease model truly fits the phenomenon of addiction.

"How do we know which urges, attractions, and desires are to be labelled "disease" and which are to be considered aspects of normal brain functioning? There would have to be a line in the sand somewhere. Not just the *amount* of dopamine released, not just the *degree* of specificity in what you find rewarding: these are continuous variables. They don't lend themselves to two (qualitatively) different states: disease and non-disease.

In my view, addiction (whether to drugs, food, gambling, or whatever) doesn't fit a specific physiological category. Rather, I see addiction as *an extreme form of normality*, if one can say such a thing. Perhaps more precisely: *an extreme form of learning*. No doubt addiction is a frightening, often horrible, state to endure, whether in oneself or in one's loved ones. But that doesn't make it a disease." (Lewis 2012)

Not only is normal behavior partly automatic, but also addictive behavior, even in its later stages, remains partly operant (reward-driven). Supporting evidence comes from numerous studies in which the reward value of the addictive goal (e.g., the amount of drug offered) shifts in relation to the reward value of an alternative goal (e.g., money). In fact, these studies show that the probability of abstaining is proportional to the relative reward value of the two choices; this sensitivity to environmental contingencies is the hallmark of operant learning. Contingency management programs, based on these principles, have shown a consistent effect in the reduction of drug use. The ventral striatum continues to be involved in reward seeking in later-stage addiction, even when the dorsal striatum dominates behavior control. In sum, a combination of deliberate and automatic neurobehavioral mechanisms characterizes both addiction and "normal" habitual behavior. (Lewis 2018)

Furthermore, telling the public that addiction is a "chronic and relapsing brain disease" and that brain scans validate this hypothesis suggests that an addict's disembodied brain holds the secrets to understanding and helping him/her. It implies that medication is necessary and that interventions must be applied directly at the level of the brain. But that's not how people recover. Wiesberg (2008), writing on this matter states:

"For actress Jamie Lee Curtis, for example, quitting painkillers was a spiritual matter. When she appeared on *Larry King Live*, the guest host asked her, "What made you get clean?" She responded, "Well, you know what, that turning point was a—was really a moment between me and God. I never went to treatment. I walked into the door of a 12-step program and I have not walked out since."

Finally, dare we ask: Why is stigma bad? It is surely unfortunate if it keeps people from getting help (although we believe the real issue is not embarrassment but fear of a breach of confidentiality). The push to destigmatize overlooks the healthy role that shame can play, by

motivating many otherwise reluctant people to seek treatment in the first place and jolting others into quitting before they spiral down too far.”

## Legal Argument

The question of whether drug addiction is a mental health problem or a behavioural problem entered the legal arena recently in a Massachusetts Supreme Judicial Court where a person (Julie Eldred) was appealing against being charged for using drugs while on probation. (McOscar, 2017) In providing expert opinion for the prosecutor, Sally Satel, a psychiatrist and scholar at the American Enterprise Institute, and Stephen J. Morse, a law and psychiatry professor at the University of Pennsylvania, persuasively argued that addiction is behaviour: "the persistent seeking and using of drugs despite negative consequences." (Heyman et al, 2017).

They maintain that while Alzheimer's sufferers have no control over the progression of their condition, addiction is the result of repeated negative choices. A plausible argument may be made that purported symptoms of the brain disease model (uncontrollable cravings; depression; anxiety; diminished impulse control; serious physical, mental, and emotional health problems) are the *result* of chronic substance abuse, not its *cause*.

Of greater concern is the risk that the majority opinion has unintentionally exacerbated the drug scourge by shielding addicts from the consequences of negative behaviour. As the prosecution argues in the case against Julie Eldred, "brain disease" rewards people like Ms. Eldred with the ready-made excuse that they have no choice but to use.

But just as touching a hot stove teaches a child to avoid hot stoves, the truth is that many addicts get clean and sober of their own volition or when the cumulative consequences of negative behaviour become the catalyst for change.

In weighing up the evidence provided by neuroscience and understandings of the psychology of drug addiction, from a legal perspective, Stephen Morse, Professor in Law at Pennsylvania University, argues that the folk-psychological model of the person and responsibility is not challenged by determinism in general or by neurodeterminism in particular. Until science conclusively demonstrates that human beings cannot be guided by reasons and that mental states play no role in explaining behaviour, the folk-psychological model of responsibility is justified. (Morse 2015)

In relation to involuntary hospitalisation of addicts at risk of dying if they do not receive treatment, Prof John Thompson, Director of Forensic Neuropsychiatry at Tulane University, gave the following considered legal opinion:

“Free will vs. disease is an argument that has little meaning to me ..... Chicken or egg arguments undermine the complexity of the addiction problem and often thwart treatment. When a drug enters the human body it cares little about why or how it got there, it’s just looking for a receptor to occupy. Thorough evaluation, accurate diagnosis, and effective long-term treatment pave the road to good outcomes.



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It is my opinion that involuntary treatment must have a prominent place in the treatment of addictive disorders. Generations in the future will look back on our response to the addiction epidemic and say, “What were they thinking”? Allowing addicted individuals to “die with their rights on” is the true iatrogenic disease of our time. Lawyers and advocates lobby for individual rights while individuals are dying by the thousands. We as a society are allowing patients with “diseases of their brains” to make poor decisions with the very same brains that are diseased in order to protect their free will. We know forced treatment and contingent treatment works especially while the individual is recovering from short- and long-term drug effects.” (Gold 2018)

## **ADDICTION: What are the key issues and what is the best way to move forward?**

A recent international research project exploring the variations in the concepts of addiction and change in concepts of addiction over time, in particular in the field of alcohol and other drug (AOD) use, draws on insights gained from in-depth interviews with policy makers, service providers and advocates in Australia and British Columbia. The research compares the different AOD addiction concepts articulated by professionals working in each setting and shows and clearly reveals the quandary that emerges, precisely, we would argue, because we haven’t looked beyond and through the limited categories of social determinants:

*“marked dissonance between perceptions of the true complexity and variability of experiences labelled addiction, and the strategic indispensability of the term and its stabilising tendencies. Whether addiction itself exists as a meaningful independent entity, whether it should be seen as a disease, what this term means and what to do with its stigmatising effects.*

***It is difficult to escape the conclusion that among those at work in our governments and AOD services there is little faith in addiction as a unitary coherent phenomenon that can be readily addressed by dedicated narrowly conceived responses, yet this idea continues to be promulgated because strategic alternatives are absent. From where might these alternatives emerge?”*** [emphasis added]

Suzanne Fraser, National Drug Research Institute, Curtin University (2016)

One alternative identified by Latour (2004, 2013) in general terms proposes that we reformulate our world, and our view of it, as a ‘multiverse of habits’. The application of this concept could result in remaking existing policy (and its expression in services) in new more flexible, more effective and less essentialising ways.

Latour proposes that we think in terms of the fluctuations and stabilisations of habit, rather than the irreversible rigidity of essence of addiction as a disease, genetic or neurological disorder. Rather, we should be asking what happens when we create addiction as a stable problem – when we take part in ‘addicting’ our world (Fraser et al., 2014)

Fraser’s recent interviews of professionals and support personnel in the AOD field suggest that treating addiction as a matter of concern existing within a ‘multiverse of habits’ means recalibrating our understanding of individual experience. Conventionally divided domains and social determinants such as cultural history and politics of colonisation of a country, family trauma, poverty and socioeconomic status of individuals need to be viewed in an integrated way. Perhaps more challengingly, adopting the concept of a multiverse of habits means understanding addiction

as fundamentally influenced by multiple factors which are unbounded, and as such, are not narrowly or exclusively negative (Pienaar et al., 2015).

It should be noted that while a vast array of approaches to dealing with drug abuse and addiction have been debated in the public arena, this is not a religious or moral issue. At the time a person suffering addiction uses their drug of choice, it is what they prefer, given what life options they believe are available to them – they have the right and responsibility to choose what they should prefer for themselves. It's not a matter of declaring those people bad if they don't live up to my vision of a "good" life. To say that addiction is chosen behaviour is simply to make a statement about whether the behaviour is within the control of the individual – it is not a judgment of the morality of the behaviour or the individual choosing it.

In her book *P.C. M.D.*, Satel (2001) critiques what she sees as the burgeoning phenomenon of 'politically correct' (PC) medicine, which seeks to address what its proponents view as social oppression by reorganizing the distribution of public health resources. She argues that incorporating social justice into the mission of medicine diverts attention and resources from the effort to prevent and combat disease for everyone. Satel (2001) considers the idea of social determination of illness as "one of the most pernicious themes in PC medicine."

Dr Nora Volkow, currently the director of the National Institute on Drug Abuse (NIDA), argues that what the brain disorder model, within the larger biopsychosocial framework, captures better than other models—such as those that focus on addiction as a learned behaviour—is the crucial dimension of individual biological variability that makes some people more susceptible than others to this hijacking. Many people try drugs but most do not start to use compulsively or develop an addiction.

Studies are identifying gene variants that confer resilience or risk for addiction, as well as environmental factors in early life that affect that risk. This knowledge will enable development of precisely targeted prevention and treatment strategies, just as it is making possible the larger domain of personalized medicine. (Volkow, 2018)

However, what also needs to be recognised is the power of the social environment, the role of stress in triggering relapse, and the risk created by growing up poor often with inadequate parental monitoring. There is clearly value in aiding recover through positive social relationships and support. It is now well acknowledged that many one-time addicts get over it — for good. Clearly addiction needs to be seen in a broader light than ever before, recognising the social, psychological, and even societal forces that get people to take drugs. (Lewis, 2018)

Addiction is indeed many things—a maladaptive response to environmental stressors, a developmental disorder, a disorder caused by dysregulation of brain circuits, and yes, a learned behaviour. We will never be able to address addiction without being able to talk about and address the myriad factors that contribute to it—biological, psychological, behavioural, societal, economic, etc. But viewing it as a treatable medical problem from which people can and do recover is crucial for enabling a public-health-focused response that ensures access to effective treatments and lessens the stigma surrounding a condition that afflicts nearly 10 percent of Americans at some point in their lives. (Volkow, 2018)

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