

Is Addiction Really a "Disease?"

Kevin T. McCauley, M.D.

Not long ago the American Society of Addiction Medicine celebrated its fiftieth anniversary. Yet even after a half-century of accomplishments, the field of addiction medicine struggles for legitimacy. And while a recent study by Harvard University and the Robert Wood Johnson Foundation demonstrated that most Americans believe that addiction is a medical problem, the debate over whether or not addiction can truly be considered a disease continues.

The argument *against* calling addiction a disease centers on the nature of free will. This argument, which I will refer to as the Choice Argument, considers addiction to be a choice: the addict had the choice to start using drugs. Real diseases, on the other hand, are not choices: the diabetic did not have the choice to get diabetes. The Choice Argument posits that the addict can stop using drugs at any time if properly coerced.

As evidence, the Choice Argument offers this scenario: a syringe of drugs is placed in front of an intravenous drug addict and the offer is made to "Spike up!" When the addict picks up the needle and bares his arm, a gun is placed to his temple and the qualifier is added that if the addict injects the drug his brains will be blown out. Most addicts given this choice can summon the free will to choose not to use drugs. The Choice Argument claims this proves that addiction is not a disease. But in real diseases - diabetes, for instance - a gun to the head will not help because free will plays no part in the disease process. So the Choice Argument draws a distinction between behaviors - which are always choices - and diseases.

This is a powerful argument. It is also wrong.

In making the argument in favor of calling addiction a disease, I think it is first important to tacitly admit that the behavior of addicts is unpleasant. To be sure, addicts can be frustrating, revolting, even criminal. But in medicine we try separate the character of the patient from their symptoms - however unpleasant or even harmful. We do not judge patients based on the palatability of their symptoms. If we did, patients with cholera - who exhibit profuse, explosive and lethally infectious diarrhea - would get the death penalty.

I would like to think that physicians do this out of a sense of clinical humility for medicine's past mistakes. We have often thought we were looking at badness when, in fact, we were looking at a disease process. (Many years ago, a group practice of doctors in Salem, Massachusetts made this mistake regarding patients with rye fungus poisoning resulting in multiple acts of malpractice.) Just because we observe bad behavior in a patient, we cannot always be certain that what is driving that behavior is some kind of intrinsic badness.

The law makes a similar distinction: except in cases of strict liability, a truly just conviction requires more than the commission of a harmful act. The prosecution must show intent, a *mens rea* - a state of mind bent on doing harm.

So when we ask the question, "Is addiction really a disease?" we find we have a question about causality: I'm seeing bad behavior, *what's the cause?* Are addicts sociopaths? Are they inherently liars, cheats and thieves? Do they have an "Addictive Personality Disorder?" Did their parents raise them improperly? Perhaps they learned

addictive behavior from a bad crowd - such as a gang? We have bad acts, yes, but do we have bad actors? Or are these symptoms of a disease?

To answer the disease question, we must have a standard. What is disease? What does it take to get into the "Disease Club" and earn all the rights and privileges that go along with that distinction? In medicine, the causal model we use to explain illness is simply called "The Disease Model." This model is only about one hundred years old. It emerged from Germ Theory - the theory described by early microbiologists such as Louis Pasteur and Robert Koch (we still use Koch's Postulates today to prove causation in medical research).

Simply put, the Disease Model says that you have an organ (bone, liver, whatever) which gets a physical, cellular defect (cells die, cancer develops, or an infection, a bullet whizzes through the organ, whatever), and as a result, you see symptoms - and you will see the same symptoms in all the patients with that defect in that organ, differing only by severity or stage of the illness.

It's easy to see how the Disease Model works. Let's take a broken leg: the organ is the femur, the defect is a fracture, and the symptoms (all the patients get the same ones) are the screaming, the bleeding, the bone deformity and the disability that we see in these patients. The beauty of the Disease Model is that it strips away the nonsense about personality and social environment and what Mom did. There is no "Femoral Personality Disorder." We don't have a problem with "Femur Gangs." The Disease Model gets us to the real cause of the problem: the fracture. It tells us how to treat this patient: we do not go after the symptoms, we go after the defect - fix that, and the symptoms go away. In the case of diabetes: the organ is the pancreas, the defect is islet cell death leading to a lack of insulin, and the symptoms are all the seemingly unrelated symptoms that go along with diabetes. We can't cure diabetes, but the model reveals how to treat it - we replace the insulin and the symptoms get better. It may not look like much (organ > defect > symptoms) but the Disease Model is so powerful a causal model that it has doubled the human lifespan in less than a century.

And one hundred years ago, doctors knew they had a winner. Doctors knew the Disease Model would boost medicine's reputation, and, for the credibility of medicine, they had to decide what was a disease and what wasn't. It was easy to see how a broken leg fit the Disease Model. They could even fit diabetes to the model. But addiction? What was the organ? The brain? Some doctors thought it might be the liver. What was the defect in addiction? And what about the symptoms? At first glance, the symptoms of addiction don't look like symptoms at all. They look like badness. And so doctors made a decision that effects every day of every addict's life: they decided that addiction was no longer a disease.

Almost overnight, all treatment innovation for addiction ended. All research into the problem of addiction stopped. And all advocacy on the part of physicians for their addicted patients ceased. When doctors could not fit addiction to the new disease model, they walked away. That didn't mean that addiction disappeared. It meant that another group of professionals had to come in and handle the problem. That group is the criminal justice system.

And so today we have over two million people in prison - many of them are non-violent drug offenders, many more were convicted for offenses committed under the influence of drugs and alcohol. Because doctors abdicated their responsibility to addicted

patients, the United States deals with addiction punitively, and has one of the highest per capita incarceration rates in human history. When you start getting into numbers like two million, this problem stops looking like a criminal justice problem and starts looking like a public health problem. The problem falls back into medicine's lap.

If ever we could fit addiction to the Disease Model - if we could show what part of the brain was involved in addiction, what the nature of the defect was, and link that defect in that organ to the symptoms of addiction, then addiction would be a disease. Everything would change. And for one hundred years we've been unable to do that.

Until now.

Just in the last few years we have finally learned enough about the brain - we have finally gotten enough pieces of the puzzle - that we know exactly what part of the brain is involved in addiction. We know exactly the nature of the defect. And we can link that defect in the brain to the frustrating, revolting and criminal symptoms of addiction. For the first time in the history of medicine we have some hard and fast knowledge about what happens in the human brain when it becomes addicted to drugs. There are very good brain chemistry reasons for the things addicts do. We can explain everything about addiction without having to resort to the tired and lazy causal variables like "bad choices" and "addict personality."

That information is very powerful. I believe it has the power to change the world. I believe that in our lifetimes, we will see everything that we do for addiction change. I believe that the people you see in my treatment center today are the last generation of Americans who will be faced with the threat of a jail cell if they don't get sober on somebody else's time frame. That is the power of this data.

Here is a brief summary of what we know in neuroscience about addiction:

1. Drugs work in the midbrain. This is not the part of the brain that handles morality, personality, parental input, sociality or conscious choice. That processing takes place in the cerebral cortex. The midbrain is the amoral, limbic, reflexive, unconscious survival brain. As humans, we have a bias in favor of the cortex: we believe that the cortex should be able to overcome the libidinal impulses of the midbrain. Normally that's exactly what happens. But in addiction, a defect occurs at a level of brain processing far earlier than cortical processing. The midbrain becomes stronger than the cortex.

2. While predisposing factors are important - genetic burden especially - the primary cause of addiction is *stress*. We all face stress, yes, but not all of us experience it in the same way. The stress that changes the midbrain is chronic, severe and unmanaged. When the cortex does not resolve the stress, the midbrain begins to interpret it as a threat to survival.

3. Persistent severe stress releases hormones such as Corticotripin Releasing Factor. CRF acts on genes for novelty-seeking and dopamine neurotransmission. People under severe stress increase their risk-taking behavior in the search for relief. At the same time, the brain's ability to perceive pleasure and reward - mediated through dopamine - becomes deranged. The patient becomes anhedonic. They are unable to derive normal pleasure from those things that used to be pleasurable. *Addiction is a stress-induced defect in the midbrain's ability to properly perceive pleasure.*

4. Drugs of abuse, whether uppers or downers, strong or weak, legal or illegal, all have one common property: they cause the rapid release of dopamine in the midbrain. If the stressed and anhedonic patient is exposed to this drug-induced surge of dopamine, the

midbrain will recognize a dramatic relief of the stress and tag the drug as a survival coping mechanism. At this point the line is crossed - from the normal or drug using or even drug abusing brain to the drug addicted brain. The drug is no longer just a drug. As far as the midbrain is concerned *it is life itself*. This process tagging of the drug is unconscious and reflexive. Conscious cortical processing is not involved.

5. Increases in stress (and CRF) trigger craving - a very cruel tool the midbrain has to motivate the individual to seek the drug. For non-addicts, craving is simply an unusually strong desire. Even though the word is the same, it is critical to remember that craving for the addict is a constant, intrusive, involuntary obsession that will persist until the drug is ingested and the survival threat is relieved. *Craving is true suffering*. The tendency to underestimate the misery of craving is a major reason for the failure of healthcare professionals to effectively intervene in addictive behavior. Brain imaging is able to demonstrate a difference in the midbrain activity of the addict and non-addict during craving. These scans also demonstrate a relative inactivity in the cortex - the part of the brain.

In the light of this new understanding of addiction in neuroscience, the Choice Argument takes several hits:

*Punishment will not work to coerce addicts into making the right choice because the drug is tagged at the level of survival. Nothing is higher than survival. And so nothing used as leverage - threat of loss of job, prison, loss of child custody - can compete with an existential threat. The midbrain give the addict the message that the way to take care of the children, keep the job, calm the probation officer is to first secure survival (by using the drug). When the craving really kicks in, punishment has no effect, and coercion is useless.

* Addiction is a disorder of pleasure. I believe all the moral loading of addiction stems from the fact that the patient with a disorder in their ability to correctly perceive pleasure is much more likely to be interpreted as being immoral before they are ever seen as being blind or deaf.

* Under stress, the addict craves drugs. As far as the midbrain is concerned, the addict's moral sense is now a hindrance to securing survival. It is not that addicts don't have values. It's that in the heat of that survival panic, the addict cannot draw upon their values to guide their behavior. Their values and their behavior become progressively out of congruence, thus increasing stress. In order to consummate the craving, the addict's cortex will shut down. *But that's not the same as badness*. The absence of one thing (cortical function) cannot stand for the presence of another thing (criminal intent).

*While it is true that a gun to the head can get the addict to chose not to use drugs, the addict is still craving. *The addict does not have the choice not to crave*. If all you do is measure addiction by the behavior of the addict - using, not using - you miss the most important part of addiction: the patient's suffering. The Choice Argument falls into the trap of Behavioral Solipsism.

* Just as a defect in the bone can be a fracture and a defect in the pancreas can lead to diabetes, *a defect in the brain leads to changes in behavior*. In attempting to separate behaviors (which are always choices) from symptoms (the result of a disease process), the Choice Argument ignores almost all of the findings of neurology. Defects in the brain can cause brain processes to falter. Free will is not an all or nothing thing. It fluctuates under survival stress.

This information allows us to fit addiction to the Disease Model: the organ is the midbrain, the defect is a stress-induced hedonic (pleasure) dysregulation, and the symptoms of addiction are loss of control of drug use, craving and persistent use of the drug despite negative consequences.

But something very important happened when I was able to fill in the Disease Model for addiction.

Addicts became patients!

And that means addicts earn all the same rights as the patient with diabetes and broken legs. If I cannot ethically punish the diabetic, I cannot do so to the addict. If I cannot effectively treat broken legs with incarceration, neither can I do so to addicts.

This begs an important question: does the treatment of addicts fall under equal protection? If punitive treatment constitutes an ethical breach for other patients, does it also for addicts? Does the demonstration of addiction's status as a disease demand parity legislation? Are coercive interventions a violation of informed consent laws? Can the same arguments used in *Lawrence v. Texas* be used in the defense of the rights of addicted patients? I'm beginning to wonder if the sharpest tool in an addiction doctor's black bag may be a law degree!