

Brain Change in Addiction as Learning, Not Disease

TO THE EDITOR: It makes sense that learning would play a role in the development and maintenance of substance-use disorders, as described by Lewis (Oct. 18 issue).¹ However, the assertion that addiction is simply or primarily related to learning has problematic implications, particularly in the midst of an epidemic of opioid use and overdoses. Lewis parenthetically acknowledges that “heroin use” (but not use of other opioids?) may prioritize “the need for medication-assisted treatment,” but the simple truth is that pharmacotherapy is much more effective than any other treatment for opioid-use disorders^{2,3} and that any effort to steer a person away from this option is frankly irresponsible. Motivation is a factor in recovery, and motivational interviewing can help, but an emphasis on motivation suggests that those who continue to use simply lack this quality and perpetuates the stigmatizing notion that persons with substance-use disorders are weak-willed. Many persons are able to lead normal lives during treatment with an opioid agonist such as buprenorphine; stating that this undertaking constitutes “obedience to a set of rules or pharmaceutical substitutes” denigrates their accomplishments.

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No potential conflict of interest relevant to this letter was reported.

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DOI: 10.1056/NEJMc1815144

TO THE EDITOR: In his review article on addiction, Lewis creates a false dichotomy between two complementary perspectives: the disease model and the learning model. Apparently fearing that medical approaches may neglect behavioral interventions, he argues against the characterization of addiction as a disease because it relies on neurobiologic processes that are essen-

tial to healthy functioning. However, many diseases involve the hijacking of normal physiology to produce pathologic states (e.g., autoimmune diseases), and aspects of patient behavior are almost always relevant to treatment (e.g., as in the treatment of asthma). When physicians tailor treatments to the patient’s overall situation, which they do routinely, and include programs for behavior modification, as they do frequently, they need not jettison their medical evaluation of the patient’s condition.

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DOI: 10.1056/NEJMc1815144

THE AUTHOR REPLIES: Rastegar claims that addiction must involve more than “simply or primarily a problem of learning.” My article examines the neurobiologic substrates of habit learning, which seem far from simple. Numerous social ills arise through habit learning, including racism, bullying, and domestic violence. These habits are not considered diseases requiring medical intervention. Rastegar also highlights the severity of the opioid overdose crisis, which is of questionable relevance. The overdose crisis is primarily an American phenomenon, largely underpinned by the economic, legal, and cultural fragmentation of one nation — not an ideal context for scientific modeling. Furthermore, most people with addictions are not addicted to opioids. Alcohol kills far more Americans than opioids,¹ and tobacco kills even more.² Importantly, opioids, unlike methamphetamine, cocaine, alcohol, and addictive behaviors (e.g., gambling), induce chemical dependency as well as habit formation; people addicted to opiates clearly suffer from the overlap of these distinct problems. Indeed, pharmacotherapy should be the frontline approach used to address the risk of opioid overdose; I prioritize heroin use simply because fentanyl-laced heroin drives approximately 50 to 90% of deaths from

overdose.³ Buprenorphine and methadone do nothing for addictions to other substances or behaviors. In reply to other criticisms, I have never implied that people suffering from addiction are weak-willed. And when I discourage “obedience to a set of rules or pharmaceutical substitutes,” my target is the one-size-fits-all treatment philosophies, including those of Alcoholics Anonymous, that are still prevalent in the United States. Addiction experts generally recognize the advantage of self-selected treatment options.⁴

Kass and Matheo claim that I propose a false dichotomy, fearing that medicine does not emphasize behavior change. Indeed, doctors attempt to influence their patients’ behaviors, but in the brief time span of most medical appointments, such influence must be limited. I agree that doctors should “not jettison their medical evaluation of the patient’s condition.” If the patient has a medical problem, such as chemical dependency, then medical evaluation is critical. But if the problem is psychological, as in addiction, doctors’ roles must be secondary (except when mediating between societal constraints, such as insurance options, and effective treatment opportunities). Finally, the argument that normal biologic functions lend themselves to disease processes seems reasonable and bears further reflection.

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Since publication of his article, the author reports no further potential conflict of interest.

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DOI: 10.1056/NEJMc1815144

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CORRECTION

Daratumumab for Delayed Red-Cell Engraftment after Allogeneic Transplantation (*N Engl J Med* 2018;379:1846-1850). In the seventh paragraph of the Case Report, beginning “Tapering . . . ” (p. 1847), and the seventh paragraph of the Discussion, beginning “Because . . . ” (p. 1849), the daratumumab dose should have been described as per kilogram of body weight, rather than per square meter of body-surface area. The article is correct at NEJM.org.

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