

Biofeedback gets new attention in learning



A Neurocore brain performance center in Boca Raton, Fla.

A group of brain performance centers backed by Betsy DeVos, the nominee for education secretary, promotes results that are nothing short of stunning: improvements reported by 91 percent of patients with depression, 90 percent with attention deficit disorder, 90 percent with anxiety.

The treatment offered by Neurocore, a business in which Ms. DeVos and her husband, Dick, are the chief investors, consists of showing movies to patients and interrupting them when the viewers become distracted, in an effort to retrain their brains. With eight centers in Michigan and Florida and plans to expand, Neurocore says it has assessed about 10,000 people for health problems that often require medication.

“Is it time for a mind makeover?” the company asks in its advertising. “All it takes is science.”

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But a review of Neurocore's claims and interviews with medical experts suggest its conclusions are unproven and its methods questionable.

Neurocore has not published its results in peer-reviewed medical literature. Its techniques — including mapping brain waves to diagnose problems and using neurofeedback, a form of biofeedback, to treat them — are not considered standards of care for the majority of the disorders it treats, including [autism](#). Social workers, not doctors, perform assessments, and low-paid technicians with little training apply the methods to patients, including children with complex problems.

In interviews, nearly a dozen child psychiatrists and psychologists with expertise in autism and [attention deficit hyperactivity disorder](#), or A.D.H.D., expressed caution regarding some of Neurocore's assertions, advertising and methods.

"This causes real harm to children because it diverts attention, hope and resources," said Dr. Matthew Siegel, a child psychiatrist at Maine Behavioral Healthcare and associate professor at Tufts School of Medicine, who co-wrote autism practice standards for the American Academy of Child and Adolescent Psychiatry. "If there were something out there that was uniquely powerful and wonderful, we'd all be using it."

Neurocore rejects any suggestion that its treatments do not work as advertised. Dr. Majid Fotuhi, Neurocore chief medical officer, said, "There is significant research to support the efficacy of neurofeedback for a variety of mental and behavioral health issues."

Ms. DeVos, whose appointment as education secretary is expected to be voted on Tuesday morning by a Senate committee, had said she would [leave Neurocore's board](#), but would retain her investment in the company, which she valued at \$5 million to \$25 million, according to documents filed this month with the Office of Government Ethics.

Last Friday, a group of Democratic senators sent Ms. DeVos a letter saying that her financial disclosure raised questions about potential conflicts. The senators were skeptical of the DeVos family trusts, and also raised questions about Neurocore, which called itself educational in a trademark dispute. The lawmakers asked Ms. DeVos if she would commit that she and her family members would not "benefit financially from actions" she could take in her new role.

At Neurocore's clinics, children and adults with A.D.H.D., anxiety, depression, autism and other psychological and neurological diagnoses sit before monitors watching movies or television

shows ranging from “Frozen” to “Mad Men,” with sensors attached to their scalps and earlobes.



<https://cdn1.nyt.com/images/2017/01/31/us/31neurocore-01/31neurocore-01-articleLarge.jpg>

Betsy DeVos, the nominee for education secretary, is a chief investor in Neurocore.

AL DRAGO / THE NEW YORK TIMES

Whenever they become distracted or anxious, the video automatically freezes. That feedback, known as conditioning, leads the vast majority of clients, company officers say, to experience improvements in their disorders after 30 45-minute sessions costing about \$2,000. Some insurers cover the treatments, while others have denied payment.

One denial concerned a 50-year-old woman with anxiety and migraines. The insurance company noted that it covered biofeedback for only a few conditions. An outside review commissioned by the Michigan insurance department supported the decision that biofeedback was not, in her case, an established therapy or medically necessary.

Experts said that thus far, studies of neurofeedback for attention deficit disorder were unconvincing. It “isn’t shown to be better than placebo, and the effects are not long-lasting,” said Sandra K. Loo, director of pediatric neuropsychology at the David Geffen School of Medicine at the University of California, Los Angeles, who has written about neurofeedback and quantitative EEG, a brain-wave test that Neurocore performs as part of its diagnosis.

“People pay a ton of money,” Dr. Loo said. “They’re desperate to help their kids. Many are desperate to not give medications.”

Dr. L. Eugene Arnold, an emeritus professor of psychiatry at Ohio State University who is enrolling children in a large, blind, controlled trial of neurofeedback — the main approach Neurocore says it uses in its sessions — said the idea was theoretically appealing, but there was not yet solid evidence of its effectiveness for A.D.H.D. Neurocore’s claims for the treatments “poison the well,” he said. “They oversell it.”

He and other experts warned of potential side effects including headaches and disrupted sleep.

Federal oversight of the field is minimal. “When it comes to treatments like this, there’s no formal body,” said Scott O. Lilienfeld, a professor of psychology at Emory University. “This has been a big problem. We don’t have an F.D.A. for psychotherapies,” he said, referring to the Food and Drug Administration.

Over the past year, the Federal Trade Commission has begun to crack down on some companies promoting the successes of brain training programs for treating a variety of problems.

Last January, Lumos Labs, the creator of Lumosity games, agreed to pay a \$2 million fine over advertising claims that said its educational-oriented games could help children perform better in school by targeting specific areas of the brain. A few months later, the F.T.C. imposed sanctions on the developers of the LearningRx “brain training” programs for advertisements that claimed its product could “permanently improve serious health conditions” like A.D.H.D., autism and dementia.

At Neurocore, patients range from young children with A.D.H.D., to older adults who are concerned about memory health, to athletes wanting to improve their performance. Neurocore promotes its ties to the Orlando Magic, which is owned by the DeVos family, and other professional athletes have appeared in advertisements for the company.

Dr. Fotuhi, Neurocore’s chief medical officer, said that there were no physicians on site at the clinics, but social workers supervise lower-level technicians, who administer the neurofeedback. Employment ads show that Neurocore’s social workers are offered less than \$20 an hour to start, yet are responsible for diagnostic assessments of patients with complex problems.

One technician, Bashar Salah, who worked for Neurocore as a new college graduate during the summer of 2015 in Sterling Heights, Mich., said some of his colleagues were still students. He earned \$10 or \$11 an hour, he said, “better than working at McDonald’s or Wendy’s, or a lot of other places that paid roughly minimum wage.”

Mr. Salah said he had known nothing about biofeedback before starting the job, but received training at Neurocore, where the employees seemed “interested in improving people’s lives.”

Amanda Farmer, who said she worked as a technician at a Neurocore center in Okemos, Mich., for eight months in 2012, watched potential clients get a hard sell.

“A lot of people were skeptical, and they gloss over any of the real questions: ‘Are you sure? This seems like a lot of money. What happens if it doesn’t do anything?’” Ms. Farmer recalled. Other current and former employees expressed similar misgivings.

Experts say there is not much standardization in the field of biofeedback, and techniques vary.

Dr. Fotuhi has impressive credentials: an M.D. from Harvard and Ph.D. in neuroscience from Johns Hopkins. However, his short-lived previous venture, NeurExpand Brain Centers in Maryland, folded after Medicare refused to reimburse services and demanded repayment for lack of scientific evidence of their effectiveness, Dr. Fotuhi said in 2015 to Bethesda Magazine.

In an interview, Dr. Fotuhi said Neurocore’s chief executive, Mark Murrison, who has been at the company for about two years, “has an emphasis on research and development and using science-based protocols.” He said the company would be publishing its results in peer-reviewed scientific literature soon.

“We are proud that our clients are highly satisfied with the care they receive and that we are able to help transform the lives of our clients for the better,” Dr. Fotuhi added in a statement.

Ms. DeVos maintains her interest in Neurocore even as she said she would divest from 102 companies and investment funds, including a family vehicle that backs business start-ups. Ms. DeVos and her husband are invested in Neurocore through the Windquest Group, their family office.

Experts said that Ms. DeVos, as a result of the investment, might have to recuse herself from discussions about the efficacy of using brain-training strategies to help school-age children. A spokesman for Ms. DeVos, however, disagreed that her stake in Neurocore was problematic.

“We reject the notion that the judgment of the Office of Government Ethics is incapable of identifying potential conflicts of interests, or that the judgment of the professionals who work there should be supplemented or supplanted by personal opinions and partisan recommendations,” said Ed Patru, a spokesman for Ms. DeVos.

Ms. DeVos is expected to receive enough votes from the Senate Health, Education, Labor and Pensions Committee — and eventually the full Senate — for confirmation. The nomination of Ms. DeVos, an outspoken critic of public education who favors charter schools, has antagonized supporters of public schools and prompted some protests.

Neurocore is the creation of Timothy G. Royer, a licensed psychologist with a master’s degree in theology, who served as division chief of pediatric psychology at the Helen DeVos Children’s Hospital in Grand Rapids, Mich.

Originally called Hope 139, after Psalm 139 from the Bible, the company marketed itself to schools — especially religious ones — in Michigan to help children improve academic scores and lessen the need for medication to treat certain ailments.

Ms. DeVos and her husband began supporting the company in 2008, for a time hosting the company in the offices of Windquest.

The company's next step, Dr. Fotuhi said, will be to start 12-week boot camps to "help the elderly with memory problems."



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