

Exercise and ADD: An Expert Interview With John J. Ratey, MD

Pippa Wysong

Editor's Note:

*Attention-deficit disorder (ADD), also called attention-deficit/hyperactivity disorder (ADHD), is often surrounded by controversy over medication use and is perceived by many as a condition that is overtreated. John J. Ratey, MD, advocates that exercise should be included in the treatment regimen, and that exercise can even reduce or eliminate the need for medication. An Associate Clinical Professor of Psychiatry at Harvard Medical School, Cambridge, Massachusetts, Dr. Ratey is author of the book *Spark: The Revolutionary New Science of Exercise and the Brain*, as well as several related books in the popular press. He also has consulted on clinical studies pertaining to exercise and psychiatric conditions.*

[click here for the interview](#)

Medscape: Can you start with some background about ADD, and how exercise affects the brain?

Dr. Ratey: First, ADD affects at least 8%-10% of children, and almost as many adults. It's now considered a biological brain disorder and may have genetic components.

There are 2 basic ways of thinking about ADD in relation to exercise: One is about the neurotransmitters norepinephrine and dopamine, both believed to be drivers of the attention system. Exercise increases the concentration of both dopamine and norepinephrine, as well as other brain chemicals. I have always said that a dose of exercise is like taking a bit of methylphenidate (Ritalin®) or amphetamine/dextroamphetamine (Adderall®); it's similar to taking a stimulant.

Second, over time, exercise helps build up the machinery to increase the amount of neurotransmitters in the brain as well as their postsynaptic receptors. Chronic exercise eventually causes growth of the system. The more fit that you are, the better the system works.

Medscape: Where do these findings come from?

Dr. Ratey: Exercise has been one of the hot topics for the past 15 years in neuroscience. The initial studies on exercise and dopamine came out in the 1960s and 1970s. I'd like to add that exercise activates the frontal cortex in all age groups. Many ADD symptoms are related to the brain's executive functions, which are located in the frontal cortex.

Medscape: Are there studies looking specifically at exercise and ADD?

Dr. Ratey: There are numerous studies about dopamine and norepinephrine and exercise, but when it comes to ADD, clinical studies with exercise are just starting.

Medscape: What got you interested this area?

Dr. Ratey: I had several marathoners for patients who had stopped marathoning because of injuries. These particular patients first got depressed, and then some presented with ADD symptoms for the first time in their lives. This was back in the early 1980s, before we really thought much about ADD -- in kids or in adults.

Medscape: ADD isn't something that can just materialize later on in life, is it?

Dr. Ratey: No. In the case of the runners, they would have had ADD before, but their exercise regimens served to keep it under control. What's been observed over the past 30 years is that athletic people who played regular sports in high school went to college but stopped exercising, and then saw the first major signs of ADD. They may have had some hint of ADD in the past, but in college it came on like gangbusters.

Medscape: How do other people in psychiatry react to the idea of prescribing exercise?

Dr. Ratey: People are just beginning to pay attention to this. It was only 2 years ago that the American Medical Association (AMA) president, in his inaugural address, said that "exercise is medicine." He said that every physician, no matter their specialty, should ask every patient at every meeting about their exercise regimen and encourage them to pursue this.

Neurology is paying more attention to exercise, with whole conferences looking specifically at exercise and Parkinson's disease, for instance. If exercise can help protect against some of the symptoms in Parkinson's disease, then it should also affect ADD, because the diseases have overlapping features.

Medscape: Is exercise starting to get respect as a treatment option?

Dr. Ratey: Yes. Historically, it started in cardiology studies. Then psychologists noted that the people in cardiac rehab were improving emotionally as well as physically. They looked at depression, anxiety, hostility, aggression, and stress in people who started an exercise regimen for cardiac protection or healing. Duke University researchers were leaders in measuring the effects of exercise on the emotional side. Exercise is now studied in practically every specialty.

Medscape: How often should patients with ADD exercise, and how intensely?

Dr. Ratey: There are a variety of exercise programs and regimens out there. Some schools have exercise breaks every hour or two, but other regimens may work, too. Someone with ADD could benefit from an exercise break of 10-15 minutes every hour or so. It helps everyone, not just patients with ADD.

Medscape: Does exercise need to be done several times daily?

Dr. Ratey: Yes, but it doesn't have to be for very long each time. Just enough to get the heart rate up for at least a few minutes. Benefits persist for a while after exercise. We know there are improvements with low levels of exercise, such as walking for 20 minutes. Of interest, a number of people at various companies, such as Merrill Lynch and Google, now have standing desks.

Medscape: Dr. James Levine, a researcher from the Mayo Clinic, mounted his desk on a treadmill so that he can walk while he works. Would walking while working help ADD?

Dr. Ratey: That's the Tread Desk and would be excellent for both adults and kids. It certainly has the potential to keep ADD in check.

Medscape: For Medscape readers, what advice should doctors give to patients?

Dr. Ratey: They should advise patients to exercise daily. Whatever medical treatment has begun, exercise needs to be included, too. It should be daily. Aerobic and strength training is

fine. Balance training is important in patients with ADD and can be accomplished with yoga, tai chi, or balance exercises. Exercise needs to become a lifestyle, a habit.

Medscape: Would regular exercise affect the medication needs of patients with ADD?

Dr. Ratey: It often does. A number of the patients described in my book got off medication completely. In people who have trouble finding the right medication regimen, exercise can really help. The exercises chosen should be fun so that people will want to do them.

Medscape: Does exercise become a chronic medication?

Dr. Ratey: Yes. However, this isn't for everyone. There is a spectrum of severity in ADD. There are plenty of marathoners who still need medicine, but maybe they need less than they would if they didn't run. A number of superathletes have ADD. A prime example today is Olympic swimmer Michael Phelps who was diagnosed at the age of 9 and put on medicine. He found it impossible to stay still in school because of ADD. Then he began swimming. When he got up to 3 hours of daily exercise, he didn't need medication anymore.

Many of these kids develop "learned helplessness syndrome." They've failed so much in the past that they now expect to fail. They get depressed, use drugs, or play video games all day. Exercise prevents people from getting into that. Animal studies have shown that exercise makes it tougher to develop learned helplessness.

Medscape: Isn't there a certain amount of positive reinforcement? If you're running from point A to point B, when you get to point B you've gotten there. You've achieved something.

Dr. Ratey: Yes; the effects on self-efficacy are huge. Although exercise helps balance brain chemistry, there are helpful incidental effects, such as self-efficacy.

Medscape: It sounds as if patients with ADD can't go wrong getting into an exercise habit.

Dr. Ratey: Them, and everyone else, although most patients with ADD will still need some medication. People can find out more from my Website www.johnratey.com.

Medscape: Thanks very much for your time today.

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