

How Does Exercise Improve ADHD Symptoms?

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It has been well established that exercise is extremely beneficial to the body as well as the brain. Dr John Ratey, clinical associate professor of psychiatry at Harvard Medical School and author of eight books including the bestseller *Driven to Distraction*, has conducted extensive research into the benefit of exercise in ADD/ADHD.

In his latest book, *Spark: The Revolutionary New Science of Exercise and the Brain*, Dr Ratey explores the connection between exercise and the brain's performance. He was kind enough to respond to a few questions.

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**Why do you prescribe exercise for treating ADHD in children (and adults)?
What are the benefits?**

Dr Ratey: There are many reasons for exercise in ADHD. Exercise almost immediately elevates dopamine and norepinephrine and keeps these levels up for a period of time, thus acting in a similar manner to small doses of Ritalin or Adderall. It also helps to still or quieten impulsivity and the cravings for immediate gratification, as it stimulates the executive function of the frontal cortex, which in turn allows for delay, better choices and provides a longer time to evaluate consequences. Dopamine helps with focus, attention and concentration on a task, while norepinephrine helps with impulsivity.

How does exercise affect learning capabilities?

Dr Ratey: Exercise affects learning in three major ways. Exercise improves the learners' ability to absorb information by heightening their senses, ability to focus, as well as improve their moods. Learners become less fidgety and tense and they feel more motivated and invigorated. In addition to priming their state of mind, exercise directly influences learning at the cellular level, improving the brain's potential.

Exercise creates an environment for the brain cells to wire together, which is the foundation of learning. One of the key chemicals that exercise increases is brain-derived neurotrophic factor (BDNF), or what I call 'Miracle Gro' for the brain - as it is truly a fertiliser. Exercise is also perhaps the best way to increase daily neurogenesis.

The process is accelerated greatly after we exercise, as this releases factors that encourage the neurogenesis process of our innate stem cells to divide, thus providing a healthier internal environment for them to grow into fully functioning nerve cells in their own right.

How does exercise affect stress levels and mood?

Dr Ratey: Exercise helps to heighten the response to stressors, i.e. patients become less stressed when confronted with the same stressors when in a fit condition. Fit people do not activate their initial stress response as quickly. Also, the phenomenon of 'stress inoculation' occurs, where cells become more resilient. By stressing the cells, internal resistance to future stressors is built up. The body is better able to use its own antioxidant enzymes, repair and rebuild proteins and improve the toxic waste disposal crews inside the nerve cells.

Improvement of moods results from the rising levels of the neurotransmitters that are generally targeted by antidepressants, such as dopamine, norepinephrine and serotonin. All these neurotransmitters, as well

as brain-derived neurotrophic factor (BDNF), are elevated during exercise and assist in reversing depressive symptoms. This works

through decreasing neuroplasticity. Exercise re-energises depressed brains into performing its function by adapting to the environment.



INTERESTING FACTS

- Exercise acts like a smart pill and boosts the brain's function
- Studies show that physical activity leads to improved brain function
- Exercise is essential to children, especially those with ADD/ADHD
- The cognitive and academic benefits of exercise are dose related - more exercise leads to better academic results.

How does exercise achieve this?

Exercise raises levels of BDNF, which:

- Builds and maintains the brain's cell circuitry
- Encourages brain cells to sprout synapses
- Strengthens cells
- Protects cells from dying out
- Exercise causes the release of certain chemicals in the brain.

Endorphins regulate mood, pleasure and pain. Dopamine has a similar effect to Ritalin. Ritalin prevents the uptake of dopamine thus increasing its level. Exercise has the same effect, which lasts about 2-3 hours, whereas the stimulants can increase for the entire day. It increases attention and the system's ability to be regular and consistent, reducing craving for new stimuli and improving alertness. Norepinephrine has a similar effect to Ritalin. Ritalin prevents the uptake of norepinephrine, as does exercise, which helps reduce impulsivity. Exercise increases serotonin levels too. These brain chemicals affect focus and attention, which are in short supply in those with ADHD.

Exercises for children and adolescents with ADHD?

- BrainGym before homework.
- Einstein's walkabout, while chewing gum (focus!)
- MARTIAL ARTS, such as Tae kwon do, karate, judo or ballet, gymnastics and yoga are useful as the participant has to pay close attention to body movements, which taxes the attention system.

Ultimately, children should be encouraged to exercise and engage in physical activities every day. Riding a bicycle, stationary bikes or trampolines are effective. Teachers should create a space or time for the children to run around and expend energy instead of relegating them to a corner as punishment.

For more information, visit www.adhdclinicjeeva.com

