Exercise makes you think

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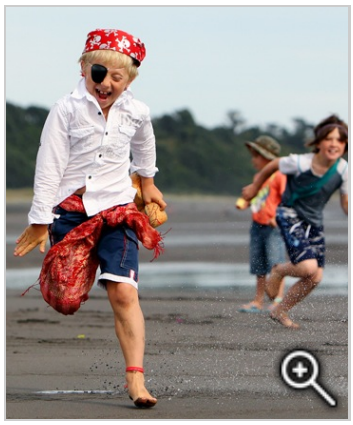

Every time we drive our kids to school, we're slowing down their brains.

To get those neurons firing, they need exercise. We all do. Researchers from around the world have found that exercise boosts brain activity and has a dramatic affect on people's ability to learn. It even improves memory in both young and

old.

One of the key figures leading the charge in this field is John J Ratey, Associate Clinical Professor of Psychiatry at Harvard Medical School.

"To keep our brains at peak performance our bodies need to work hard," he says in his book, Spark: The Revolutionary New Science of Exercise and the Brain.

Ratey says it's already known that exercise increases levels of serotonin, norepinephrine and dopamine, which are important neurotransmitters that deal with thoughts and emotions. Many people may have heard of serotonin and know that a lack of it is associated with depression.

"But even many psychiatrists I meet don't know the rest," he says.

"They don't know that toxic levels of stress erode the connections between the billions of nerve cells in the brain or that chronic depression shrinks certain areas of the brain, and they don't know that conversely exercise unleashes a cascade of neurochemicals and growth factors that can reverse this process, physically bolstering the brain's infrastructure.

"In fact, the brain responds like muscles do, growing with use and withering with inactivity.

BRAIN-BOOSTING TIPS

1. Have a walking meeting. If you're going to meet a mate for lunch, grab a quick bite and then head out for a brisk walk, or schedule a chat on the go with a work colleague - you wouldn't believe what incredibly creative ideas you'll come up with. Have a small notebook in hand and a pen to jot down ideas. Best for two or three people.

2. If you're sitting at your desk and you can't think or you are getting tired, try a block break. That means walk around the block at a fast pace. You will be amazed at how the thoughts start to flow. This is especially good for those afternoon low times and works much better than a cup of tea. Remember to drink water, though.

3. Walk, bike, skate or skateboard to work or school. Not only will the neurons be firing and the blood flowing, but so will your energy.

The neurons in the brain connect to one another through leaves on tree-like branches and exercise causes those branches to grow and bloom with new buds, thus enhancing brain function at a fundamental level."

Ratey says he found the best example of exercise and the brain in practice at Naperville Central High School, where a Learning Readiness Physical Education Programme has been put in place. The school has found that a vigorous workout before class especially helps those struggling with reading and maths. Many students start the day with a "zero hour" PE session and then head to lessons. After 20 minutes of learning, they have a quick "brain break", which could be a ball- skills session at the back of the class to get them refocused, then it's back to work. Results have improved dramatically. Student reading has gone up one to two levels and maths results have risen 10 to 23 per cent.

4. Use your lunchtime for exercise. Start early, organise with your boss to take a bit of extra time and then go for a swim, jog, to the gym or bike ride. Go by yourself or even better, with your workmates, for a bit of team bonding.

5. If you can't fit in exercise before or during work or school, evening fitness sessions also work wonders. This is especially important for students sitting exams or who have heavy study loads. Exercise first, if possible, then come home and study hard. Your brain will be in a perfect state to focus.

The programme, started by Paul Zientarski in 2005, has improved student engagement, helped with motivation and brain scans have shown exercise activates all parts of their brain. At Georgia Health Sciences University in the United States, a study has shown that regular exercise can improve the ability of overweight, previously inactive children to think, plan and even do maths.

The researchers worked with 171 overweight 7-11-year-olds, who were all sedentary when the study started. They measured the children's planning and academic skills in maths and reading. A subset of the children received functional magnetic resonance imaging highlighting increased or decreased areas of brain activity.

MRIs showed those who exercised experienced increased brain activity in the prefrontal cortex - an area associated with complex thinking, decision- making and correct social behaviour - and decreased activity in an area of the brain that sits behind it.

Dr Catherine Davis, clinical health psychologist at the university's Georgia Prevention Institute and corresponding author on the study, says the shift forward appears consistent with more rapidly developing cognitive skills.

The study also shows the more the children exercised, the better the results. Intelligence scores increased an average 3.8 points in those exercising 40 minutes a day after school for three months, with a smaller benefit in those exercising 20 minutes a day.

"I hope these findings will help re-establish physical activity's important place in the schools in helping kids stay physically well and mentally sharp," Davis says.

"For children to reach their potential, they need to be active."

Exercise also helps at tertiary level. At the University of Dublin, a study of sedentary male Trinity College students took part in a memory test following vigorous exercise.

The students were first asked to watch a series of photos with the faces and names of strangers. They were given a break, then asked to remember the names they had seen as the photos again appeared on a screen.

Next up, the students were split into two groups. Half rode stationary bicycles until they were exhausted, while the others sat quietly for 30 minutes. Then it was time to be tested again.

Interestingly, the students who had exercised achieved far better results on the memory test than they did the first time around, while their sedentary peers failed to improve at all.

The men also gave blood samples during the experiment and these showed the blokes on bikes had much higher levels of a protein known as brain-derived neurotrophic factor, or BDNF.

This protein helps to support the survival of existing neurons and encourage the growth of new neurons and synapses. It is active in the hippocampus, cortex and basal forebrain, which are all areas vital to learning, memory and higher thinking.

Exercise is also vital for boosting brain function in the elderly. Not only can it help prevent brain diseases, but it can help those with Alzheimer's disease and dementia.

There is a great deal of literature on this, but the simple explanation comes from Exercises For Brain Health author William Smith, who writes: "Neurons grow in the hippocampus through a process called neurogenesis. If the hippocampus is starved of oxygen [a condition called hypoxia], it can hinder learning and memory capacity and, if left untreated, it may result in conditions such as Alzheimer's disease. Exercise aids in neurogenesis by increasing blood flow to the brain and stimulating the nervous system through new and challenging exercise movements."

So the brain-boosting answer is to get moving to keep thinking and learning for life. Here's a radical idea - perhaps schools throughout New Zealand could start each day with 40 minutes of exercise to get brains fired up for learning - pupils and teachers.

- Taranaki Daily News

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