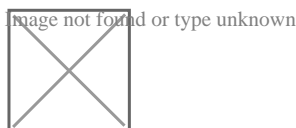


A Sound Mind In A Sound Body, Does exercise make the mind healthier?

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For thousands of years we have known that exercise is a key to a healthy body, but only recently, and until now anecdotally, have scientists considered that exercise enhances existing mental acuity. This question spawned a new study at the University of South Carolina during which scientists compared mice who ran for an hour each day with mice who remained sedentary. The results have important implications for neurodegenerative diseases like Parkinson's and Alzheimer's diseases.

While earlier studies demonstrate that exercise prompts neurogenesis, creation of new brain cells, nothing to date has considered the effect of exercise on existing neural networks. The scientists at South Carolina wanted to see if exercise will actually make an existing brain better and more healthy.



Exercise's ability to reform muscles by increasing the number of muscle mitochondria to make them more durable and fatigue-resistant is established science. Increasing the number of mitochondria not only increases the level of endurance, but increases longevity by increasing obesity, diabetes and heart disease. It is one of the most powerful cellular reactions.

But until the scientists at South Carolina put it to the test, no one had studied whether a similar response occurs in the brain.

In fact the brain works out right along with the muscles. "The brain has to work hard to keep the muscles moving" and all of the bodily systems in sync, says J. Mark Davis, a professor of exercise science at the Arnold School of Public Health at the University of South Carolina and senior author of the new mouse study, which was published last month in *The Journal of Applied Physiology*.

After two months, the mice who had exercised an hour each day were able to run an average of 126 minutes on the treadmill versus 74 minutes for those who had not trained. That could have been predicted. However, when the brain tissue was examined, in the mice that exercised, scientists discovered increasing mitochondrial development across the brain, even though some areas showed more development than others.

Sedentary mice displayed no increase in mitochondrial activity. Dr. Davis and their colleagues conclude in their paper that the two months of training, “is sufficient stimulus to increase mitochondrial biogenesis.”

“There is evidence” from other studies “that mitochondrial deficits in the brain may play a role in the development of neurodegenerative diseases,” including Alzheimer’s and Parkinson’s diseases, Dr. Davis says. Having a larger reservoir of mitochondria in your brain cells could provide some buffer against those conditions, he says.

Many studies indicate that long-term runners have a lower risk of neurological disease. But aside from that, Dr. Davis believes that re-energized brain cells could behave like mitochondrial-drenched muscle cells becoming more resistant to fatigue and, since bodily fatigue is partly mediated by signals from the brain, it may allow a person to exercise more.

He continues to say that revitalized brain cells could reduce mental fatigue, sharpening thinking “even when you’re not exercising.”

The best news? The scientists in South Carolina seem to think that a 30 minute jog would suffice in humans.