Brain effects of bicycling and walking

The physical benefits of bicycling and walking are evident, but what about the effects on the brain?

Scientists have been busy studying the effects of bicycling and walking on mood, cognition, memory and brain-related disease. Positive results have been found across all age groups for those who walk or ride bicycles.

Danish scientists found that while diet helps children with academic performance, of greater significance was the form of transportation children used to travel to school.

The study, carried out by researchers from Copenhagen and Aarhus Universities in Denmark in collaboration with the Research Center OPUS and Danish Science Communication, looked at nearly 20,000 students between the ages of 5 and 19. It found that those who cycled or walked to school, rather than traveling by car or public transportation, performed measurably better on tasks demanding concentration, such as solving puzzles, and that the effects lasted for up to four hours after they got to school.

John Ratey, professor of psychiatry at Harvard Medical School, conducted a study on students with attention deficit hyperactivity disorder to see how exercise might boost levels of neural transmitters.

"Exercise, good fitness-based exercise, makes our brain more ready to learn," Ratey said. By exercise, Ratey is not meaning just bicycling and walking, but there are several studies easily found online that prove the performance-enhancement attributes of bicycling and walking to school. For more thought-provoking insights from Dr. Ratey, you might check out his book Spark: The Revolutionary New Science of Exercise and the Brain.

In 2003, Jay Alberts, a neuroscientist at the Cleveland Clinic Lerner Research Institute in Ohio, in order to raise awareness about Parkinson's Disease, rode a tandem bicycle across the state with a friend who had the disease. Alberts's goal was only to demonstrate that the disease does not have to be a life-altering disease and that an active lifestyle can be maintained after diagnosis. After two days of tandem riding, the patient reported improvement in her symptoms. That ride and the resulting findings were serendipitous but motivated Alberts to conduct further experiments, the results of which were reported in late 2012. Alberts scanned the brains of Parkinson's patients during and after an eight-week program of cycling, using stationary bikes. Half the patients were allowed to go at their own pace while the other half were pushed harder, just as the scientist's tandem-bike companion had been. All patients improved and the tandem group showed significant increases in connectivity between areas of grey matter responsible for motor ability. Cycling, and cycling harder, was helping to heal their brains.

One conclusion from Nurses' Health Study, a longitudinal study including 18,766 U.S. women aged 70 to 81 years, is this: Long-term regular physical activity, including walking, is associated with significantly better cognitive function and less cognitive decline in older women.

Another study by the University of California in Los Angeles showed that elderly people who were most active had more gray matter than those who were least active. Having more gray brain cells translates into a lower risk of Alzheimer's disease.

Exercise is good for the brain, but some researchers believe that not all exercise is equal. In a German study of 115 students, half the group did activities that involved complex coordinated movements such as cycling. The other half performed simpler exercises with the same aerobic demands. Both groups' performance on concentration tests improved after the exercise, but the complex group's performance was much greater than the other group's performance.

Some researchers believe that pedaling has a mood-enhancing effect on the brain, that the movement of the pedals causes brain changes similar to those seen during meditation. For that reason, it is believed bicycling can help ease depression and brighten mood.

Mayor Randy Rhoads has proclaimed May as Bike and Walk Month. The mayor's proclamation states many more reasons why it's good for us to be out bicycling and walking in our community. The proclamation can be found at www.livablestreetsls.com.

Kathy Biagioli, a Lee's Summit resident, middle school teacher, is Chair of the Education and Encouragement Subcommittee of the Lee's Summit's Livable Streets Advisory Board. The Livable Streets Advisory Board is a Mayor-appointed, volunteer board whose goals include working to make our community and our streets more "livable", safe and accessible for all of our citizens.