

## **A Little Music With Exercise Boosts Brain Power, Study Suggests**

COLUMBUS, Ohio – It's no secret that exercise improves mood, but new research suggests that working out to music may give exercisers a cognitive boost. Listening to music while exercising helped to increase scores on a verbal fluency test among cardiac rehabilitation patients.

"This is the first study to look at the combined effects of music and short-term exercise on mental performance," said Charles Emery, the study's lead author and a professor of psychology at Ohio State University.

"Evidence suggests that exercise improves the cognitive performance of people with coronary artery disease," Emery said. "And listening to music is thought to enhance brain power. We wanted to put the two results together." Those results appear in a recent issue of the journal *Heart & Lung*.

The study included 33 men and women in the final weeks of a cardiac rehabilitation program. Most participants had undergone bypass surgery, angioplasty or cardiac catheterization. Coronary artery disease may compromise cognitive ability, Emery said; that's why he and his colleagues chose cardiac rehabilitation patients for this study.

The researchers asked participants to complete a verbal fluency test before and after two separate sessions of exercising on a treadmill. The workouts were scheduled a week apart and lasted about 30 minutes. Participants listened to classical music – Vivaldi's "The Four Seasons" – during one of the sessions.

"We used 'The Four Seasons' because of its moderate tempo and positive effects on medical patients in previous research," Emery said. "But given the range of music preferences among patients, it's especially important to evaluate the influence of other types of music on cognitive outcomes."

As a way to measure anxiety and depression, participants completed a 30-item checklist before and after exercise. The list included adjectives to describe the patient's current mood. The researchers also tested each person's verbal fluency before and after each exercise session by asking participants to generate lists of words in specific categories.

"This kind of task challenges the part of the brain that handles planning and abstract thought as well as a person's capacity for organized verbal processing," Emery said.

Participants reported feeling better emotionally and mentally after working out regardless of whether or not they listened to music. But the improvement in verbal fluency test performance after listening to music was more than double that of the non-music condition.

"Exercise seems to cause positive changes in the nervous system, and these changes may have a direct effect on cognitive ability," Emery said. "Listening to music may influence cognitive function through different pathways in the brain. The combination of music and exercise may stimulate and increase cognitive arousal while helping to organize cognitive output."

Emery conducted the study with Evana Hsiao and Scott Hill, both with Ohio State, and David Frid of Pfizer, Inc. A grant from the National Heart, Lung and Blood Institute helped fund this research.