

## Exercise, endurance sports increase arrhythmia and heart failure risk in carriers of ARVD/C mutation

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A Johns Hopkins study finds that healthy people who carry a genetic mutation for arrhythmogenic right ventricular dysplasia/cardiomyopathy (ARVD/C) are at much higher risk of developing the symptoms of the life-threatening heart disease if they participate in endurance sports and frequent exercise. The study also suggests that those carriers who significantly cut back on their exercise regimen may reduce their risk or delay the onset of symptoms.

An article on the study results is published online July 17, 2013, in the *Journal of the American College of Cardiology*.

"The results of this study reveal for the first time that the amount and intensity of exercise among people who carry a mutation increase the likelihood of developing [ventricular arrhythmias](#)—a very serious heart rhythm disturbance, and heart failure," says lead author Cynthia James, Ph.D., a genetic counselor in the Johns Hopkins ARVD/C program, part of the Johns Hopkins University School of Medicine's Division of Cardiology.

"In our study, we also found that those who engaged in [vigorous exercise](#) developed their first symptoms at age 30, on average, while those who did not have such a rigorous [exercise regimen](#) began having symptoms at an average age of 40," James says.

ARVD/C is an inherited disorder and one of the most common causes of sudden death in athletes and young, apparently healthy adults. Its prevalence is estimated at one in 5,000 people. The disorder causes scarring of the heart muscle, mainly on the right side, which interrupts the normal electrical activity of the heart. Symptoms include very fast, abnormal heart beats that prevent the heart from adequately pumping blood to the rest of the body. ARVD/C can also lead to [heart failure](#).

Although the genetics of ARVD/C are complex and not fully understood, it clearly runs in families, and the number of people carrying the mutation is thought to be much larger than the number diagnosed with the disease.

People who are diagnosed with ARVD/C already are counseled at Johns Hopkins to stop exercising because it is known to accelerate the disease process. The researchers say the new study was designed to find out if the same advice should apply to healthy carriers of the mutation.

"Increasing numbers of people are having genetic testing for ARVD/C once they find out that a member of their family has the mutation," says Hugh Calkins, M.D., a heart rhythm specialist and professor of medicine who is also director of the Johns Hopkins ARVD/C program. "This is important information for them and their physicians."

Calkins, who is the senior author of the study, adds, "This is one of the very rare instances in which we would advise against regular exercise. However, our study shows that people who carry the mutation need to be cautious, and we hope that the data will help these individuals avoid life-threatening complications down the road."

The researchers evaluated 87 people (46 males and 41 females), looking at which individuals routinely engaged in vigorous aerobic exercise and how many hours the participants spent per year in those activities.

Participants in the study ranged in age from 11 to 88. They were all enrolled in the Johns Hopkins ARVD/C registry and carried a mutation associated with ARVD/C.

Half of the participants had early symptoms of the disease, such as heart palpitations or a fainting episode. The other half appeared healthy and had no symptoms. The participants were followed for an average of eight years.

"Among those who did the most exercise daily, about two hours each day, 75 percent developed their first life-threatening arrhythmia during the course of the study. In contrast, those who heeded advice to cut back to little or no exercise had a much lower, 12 percent risk, within the eight-year follow-up period," says Aditya Bhonsale, M.D., a co-author and clinical fellow in the Johns Hopkins Division of Cardiology.

Provided by Johns Hopkins University School of Medicine

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