

Exercise may improve kidney function in obesity, reduce risk of renal disease

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Aerobic exercise may reduce the risk of diabetes-related kidney disease in some people, according to a new study. The findings are published ahead of print in the *American Journal of Physiology—Renal Physiology* and was chosen as an *APS select* article for December.

Kidney (renal) disease is a common complication associated with type 2 diabetes, especially in people who are obese and do not exercise regularly. Early markers of diabetes-related [kidney](#) disease include high levels of protein in the urine and a reduced ability of the kidneys to filter out waste from the bloodstream. Chronic kidney disease can also lead to an imbalance of minerals in the body, particularly in the bones. Altered bone [mineral content](#) may contribute to disorders, such as the bone-weakening disease osteoporosis.

Researchers studied two groups of rats—both composed of a combination of lean and obese animals—to explore the effect of exercise on kidney disease risk factors. The "exercise" group was exercised on a treadmill for 45-60 minutes each day, five days a week. The "sedentary" group was trained for 15 minutes twice a week to mimic a human sedentary lifestyle.

The most significant finding the researchers saw was an improvement in blood vessel health and overall kidney function. All of the obese rats, regardless of group, had hardening or scarring of the renal arteries, increased protein in the urine, and fat deposits within the filtering structures of the kidneys. However, the obese rats in the [exercise group](#)

showed a reduction in these factors when compared to the sedentary obese rats. The exercised obese rats also had changes in bone composition—higher levels of calcium and copper, but lower concentrations of iron—when compared to the lean rats. These changes were not enough, however, to affect the risk of developing osteoporosis.

"We conclude that the introduction of an exercise program based in [aerobic interval training] is a good strategy to present alterations in kidney structure and urinary parameters caused by obesity and the development of diabetic [[kidney disease](#)] in obese Zucker rats," the researchers wrote.

More information: Rosario Martinez et al, Aerobic interval exercise improves renal functionality and affects mineral metabolism in obese Zucker rats, *American Journal of Physiology-Renal Physiology* (2018). [DOI: 10.1152/ajprenal.00356.2018](https://doi.org/10.1152/ajprenal.00356.2018)

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