

Exercise may help protect smokers from inflammation, muscle damage

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Regular exercise may protect smokers from some of the negative effects associated with smoking, such as muscle loss and inflammation, according to a new study. The article is published ahead of print in the *American Journal of Physiology—Regulatory, Integrative and Comparative Physiology*.

Smoking can cause a number of system-wide physiological changes in addition to local damage to the lungs. Inflammation that begins in the pulmonary system can "spill over" into the circulatory system to cause damage to other organs throughout the body, explained a team of German researchers. Inflammation can also interact negatively with the protein pathways in the body, causing muscle to break down more quickly than it is produced. This process leads to [muscle loss](#), also called [muscle wasting](#) or atrophy, which causes weakness.

The researchers studied markers of inflammation in the blood and [muscle fibers](#) from two groups of mice that were exposed to cigarette smoke on a long-term basis. One group performed daily running tests on a treadmill for the last eight weeks of the study ("smoke-exposed exercise"), while the other group did not exercise ("smoke-exposed"). Both smoke-exposed groups were compared to age-matched controls not exposed to smoke.

Markers of [inflammation](#) increased in the blood and muscle samples of the smoke-exposed group but improved significantly in the smoke-exposed exercise group after the research team introduced the treadmill

tests. Both smoke-exposed groups had a lower muscle weight when compared to the control group and showed a decrease in fiber area in the muscles prior to introduction of exercise. Exercise reversed some of this type of damage in the smoke-exposed exercise group. "Regular endurance exercise training seems to protect long-term smokers against some important negative local and systemic consequences of smoking," the researchers wrote.

More information: Karsten Krüger et al. Exercise training reverses inflammation and muscle wasting after tobacco smoke exposure, *American Journal of Physiology - Regulatory, Integrative and Comparative Physiology* (2017). [DOI: 10.1152/ajpregu.00316.2017](https://doi.org/10.1152/ajpregu.00316.2017)

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