

# Quitting smoking can reverse asthma-inducing changes in lungs

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Asthmatic smokers may be able to reverse some of the damage to their lungs that exacerbates asthmatic symptoms just by putting down their cigarettes, according to research out of the University of Groningen in the Netherlands.

The research is published in the December 15 issue of the American Thoracic Society's [American Journal of Respiratory and Critical Care Medicine](#).

"We found that exposure to cigarette smoke appears to increase the thickness of the epithelium, or lining, of the airways in the lung. This may be the underlying cause of the fact that smoking asthma patients experience more asthma symptoms, such as shortness of breath and phlegm production, compared to non-smoking asthma patients," said Martine Broekema, Ph.D., the lead author of the study.

Dr. Broekema and colleagues examined patients with asthma who were assessed each for the severity of their asthma and allergy, given questionnaires to determine the extent of their smoke-induced symptoms, and then underwent bronchial biopsies. Of the total of 147 patients, 66 never smoked, 46 were ex-smokers and 35 were current smokers.

In addition to the changes in the epithelial thickness, Dr. Broekema found distinct differences between the current smokers and the ex- and non-smokers. "In addition to the epithelial thickening, we found that

[cigarette smoke](#) negatively affects levels of exhaled nitric oxide, making it an unreliable indicator of asthma severity in smokers," she said.

Current smokers also had more mucous-producing goblet cells in their epithelium and, the epithelial cell layer contained more mucus protein overall, when compared to never-smoking asthmatics. "These pathological findings were associated with the severity of phlegm production reported by the [asthma](#) patients, suggesting a causal relationship between the two. Smoking asthmatics also showed a distinct inflammatory profile in their lungs compared to never-smoking asthmatics, with a lower number of eosinophils and higher number of mast cells," said Dr. Broekema. "Furthermore, our data suggest that smoking cessation can reverse the thickening of the lining of the airways."

To determine the role of exposure length on asthmatic lungs, the scientists divided the ex-smokers into two groups: those with fewer than the median 3.4 pack-year exposure and those with more than 3.4 pack-years.

Interestingly, while they expected to find evidence of a dose-response effect between smoking and epithelial remodeling, no such association was apparent between the number of pack-years or duration of smoking cessation and epithelial remodeling.

"To our surprise, these two sub-groups of ex-smokers showed no difference in any outcome measure. These sub-analyses indicate that the amount of smoke exposure in the past does not influence our outcome measures," said Dr. Broekema. "This study shows again how important [smoking cessation](#) is for pulmonary health, and this appears to be especially true for asthmatic patients. The good news is that quitting appears to have a measurable benefit in these individuals."

Source: American Thoracic Society ([news](#) : [web](#))

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