

## Indoor air cleaners ease asthma symptoms in children living with smokers

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A Johns Hopkins Children's Center study of Baltimore City children who have asthma and live with smokers shows that indoor air cleaners can greatly reduce household air pollution and lower the rates of daytime asthma symptoms to those achieved with certain anti-inflammatory asthma drugs. Although the air cleaners improved the overall air quality in homes, they did not reduce air nicotine levels and did not counter all ill effects of second-hand smoke, the researchers warn.

Parents should be counseled to implement a total ban on indoor smoking and use air cleaners only as a temporary tool on the way to achieving a smoke-free household, the Hopkins team concludes in the Aug. 1 issue of the *Archives of Pediatrics & Adolescent Medicine*.

"Air cleaners appear to be a an excellent partial solution to improving air quality in homes of children living with a smoker but should not be viewed as a substitute for a smoke-free environment," says lead investigator Arlene Butz, Sc.D., M.S.N., C.P.N.P., an asthma specialist at Johns Hopkins Children's and professor of pediatrics at the Johns Hopkins University School of Medicine.

For the study, researchers followed for six months 115 children, ages 6 to 12 years, who lived in homes where one or more caregivers smoked. Each one of 41 households received two free-standing air cleaners plugged into the bedroom and living room. Another one-third of the homes got air cleaners plus at-home health education by a nurse on the dangers of second-hand smoke, and the other third got neither but were



given air cleaners at the end of the study. The researchers measured air <u>nicotine</u> levels and air particulate matter — microscopic bits of smoke, soil, pollen, dust and spores usually floating around in the air — before air cleaner installation and six months later. They also compared asthma symptoms and cotinine (the biological marker of nicotine found in the urine) between children living in homes with and without air cleaners.

The overall air quality in homes with air cleaners showed a nearly 50-percent drop in the levels of particulate matter, although the air never reached the quality of smoke-free homes, the researchers note. Homes that received both air cleaners and visits by health coaches did not achieve better <u>air quality</u> than homes that got air cleaners alone. The levels of air nicotine and urine cotinine remained similar in all children, regardless of air cleaner use in the home.

The study also found that children living in homes with air cleaners had considerably more days without coughing, wheezing or difficulty breathing compared with children living in homes without air cleaners. Based on the rate of symptom reduction observed in this study, the researchers estimate that a child with asthma living in a home with indoor air filtration would, on average, have 33 more symptom-free days per year compared with a child living in a smoking household without indoor filtration. The number of symptom-free days made possible by the air cleaners was nearly the same as the number achieved with the use of a type of anti-inflammatory asthma drug in another study, the investigators note.

"Our findings show a clear link between improved <u>asthma symptoms</u> and the use of air cleaners, providing further evidence that air cleaners could play an important role in the treatment of children with asthma," said coinvestigator Patrick Breysse, Ph.D., professor at the Johns Hopkins Bloomberg School of Public Health and director of the Johns Hopkins Center for Childhood Asthma in the Urban Environment.



Because smoking is a main driver of indoor <u>air pollution</u>, the researchers recommend the use of air cleaners even in smoke-free homes if they are part of multi-family dwellings in which second-hand smoke can easily seep in from surrounding units.

Asthma is the most common pediatric chronic illness, affecting 6.5 million children in the United States, according to the Centers for Disease Control and Prevention. More than 30 percent of children in the United States share a home with a smoker, and up to two-thirds of children in urban neighborhoods live with a least one smoker, the researchers say.

Provided by Johns Hopkins Medical Institutions

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