

Children exposed to two phthalates have elevated risk of asthma-related airway inflammation

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Children exposed to diethyl phthalate (DEP) and butylbenzyl phthalate (BBzP)—phthalate chemicals commonly found in personal care and plastic products—have elevated risk of asthma-related airway inflammation, according to researchers at Columbia Center for Children's Environmental Health (CCCEH) at the Mailman School of Public Health.

Of the 244 children aged 5 to 9 in the study, all had detectable levels of phthalates in their urine although these varied over a wide range. Higher levels of both phthalates were associated with higher levels of nitric oxide in exhaled breath, a [biological marker](#) of [airway inflammation](#). The association between BBzP exposure and airway inflammation was especially strong among children who had recently reported wheeze, a common symptom of asthma. Results were recently published online in the *American Journal of Respiratory and [Critical Care Medicine](#)*.

"While many factors contribute to childhood asthma, our study shows that exposure to phthalates may play a significant role," says Allan Just, PhD, first author on the new CCCEH study and current postdoctoral researcher at the Harvard School of Public Health.

Dr. Just and co-investigators looked at children enrolled in the CCCEH Mothers and Newborns study. All live in Northern Manhattan and the South Bronx where [asthma prevalence](#) is high. Exposure to phthalates

was measured through a urine test, and the level of nitric oxide in the child's exhaled breath was quantified as a marker of airway inflammation.

The study is the first to use exhaled nitric oxide in a study of [phthalate exposure](#) in children. By using the biomarker in exhaled breath, the researchers overcame a significant hurdle. "Many asthma patients only have [asthma exacerbations](#) a few times a year, making it difficult to discern short-term associations between environmental exposures and the disease," explains Matthew Perzanowski, PhD, senior author and Associate Professor of [Environmental Health Sciences](#) at the Mailman School. "To solve this problem, we used nitric oxide, which has been shown to be a reliable marker of airway inflammation in response to known asthma triggers like vehicle emissions."

Phthalates are used widely in consumer products, including plastics, vinyl flooring, and personal care products, making exposure ubiquitous in the United States and other developed nations. Phthalates enter the body through ingestion, inhalation, and absorption through the skin. However, past research has suggested inhalation to be a particularly important route of exposure to the two phthalates associated with airway inflammation in this study. Several phthalates are known to disrupt the endocrine system and early-life exposure has been linked not only to asthma but also to adverse neurobehavioral and reproductive effects. A recent study by Dr. Just and other CCCEH investigators found that prenatal exposure to BBzP was linked with increased risk of childhood eczema.

Provided by Columbia University's Mailman School of Public Health

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