

Scientists create most accurate tool yet developed to predict asthma in young children

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Children with asthma use inhalers to relieve some of their symptoms, which include coughing, wheezing, chest tightness and shortness of breath. Credit: Tradimus / Wikimedia commons / [CC BY-SA 3.0](#)

Scientists at Cincinnati Children's Hospital Medical Center have created and tested a decision tool that appears to be the most accurate, non-invasive method yet developed to predict asthma in young children.

The researchers hope the Pediatric Asthma Risk Score (PARS) will become the most common tool used by medical practitioners to predict [asthma](#) and help prevent the common airway disease from developing.

"PARS is superior to the Asthma Predictive Index (API) in its ability to predict asthma in [children](#) with mild to moderate asthma risk, with an 11 percent increase in sensitivity," says Gurjit Khurana Hershey, MD, Ph.D., director of Asthma Research at Cincinnati Children's and senior author of the study. "Children with mild to moderate risk may be the most likely asthma patients to respond favorably to prevention strategies."

The study, published online in the *Journal of Allergy and Clinical Immunology*, found that the API missed 43 percent of asthmatic children identified by PARS as mild to moderate risk. PARS and the API equally predicted asthma risk for children with the most risk factors.

The API has been seen as the gold standard to which other [predictive models](#) have been compared. While useful for predicting which children will not develop asthma, it "leaves much room for improvement in terms of identifying children who will," says Jocelyn Biagini Myers, Ph.D., a researcher in the division of Asthma Research and lead author of the study. A notable achievement of the PARS over the API is that it delivers a personalized asthma risk score to the patient, she says.

The PARS tool included new and less invasive criteria than previous tools. Additions included [demographic data](#) and clinical factors routinely collected during an asthma or allergy assessment in a doctor's office.

Dr. Khurana Hershey and her colleagues devised the tool using data from the Cincinnati Childhood Allergy and Air Pollution study—a group of 762 infants born between 2001 and 2003 in Cincinnati and northern Kentucky. These were children of parents who had at least one allergy

symptom. The children were examined annually at the ages of 1, 2, 3, 4 and 7 for the development of allergic disease. They were skin tested for 15 airborne and food allergens including cat, dog, cockroach, dust mites, trees, mold, weeds, grass, cow's milk and hen's egg.

Of the 762 infants, 589 were evaluated for asthma development at the age of 7 using objective measures of lung function. Sixteen percent had asthma. The researchers also queried parents for numerous factors that contribute to asthma risk.

The children with asthma at age 7 were more likely to have at least one parent with asthma, two or more positive skin tests to airborne or food allergens, eczema at a young age, wheezing apart from colds, frequent wheezing at a young age, a diagnosis of allergic rhinitis in the first three years of life, and to be African-American.

The researchers compared the PARS model to the original API and found it to be 11 percent more sensitive than the API.

"Our PARS model either outperforms and/or is less invasive than 30 existing models intended to predict asthma development," says Dr. Khurana Hershey. "The PARS also may be more clinically useful and applicable in an office setting."

To facilitate easy implementation of PARS in clinical and research settings, the study contains a PARS scoring sheet that includes the [decision tool](#) and clinical interpretations. A PARS web application, which provides fast and easy calculation, is accessible at <https://pars.research.cchmc.org>. Smartphone apps are being developed for the iPhone and for android phones.

Asthma affects 25.7 million people in the United States, including 7 million children, and its global therapeutic costs is estimated at more

than \$5 billion a year.

More information: Jocelyn M. Biagini Myers et al, A Pediatric Asthma Risk Score to better predict asthma development in young children, *Journal of Allergy and Clinical Immunology* (2018). [DOI: 10.1016/j.jaci.2018.09.037](https://doi.org/10.1016/j.jaci.2018.09.037)

Provided by Cincinnati Children's Hospital Medical Center

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