

Repeated preschool wheeze may set the stage for long-term damage in lung function

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Children who wheeze are at risk of developing damage that will affect their lung function by the age of 6 years, according to researchers at CHU Sainte-Justine Hospital and the University of Montreal. These appear to be persistent, even if asthma symptoms seem to disappear at least temporarily by school age in several cases. Children with recurrent symptoms that are severe enough to warrant a visit to the emergency department are particularly at risk of seeing their lung function affected. This may persist in adulthood and into their forties, even if they have gone through a period of asthma remission during their childhood or adolescence. Preschool wheezing could be a risk factor for to chronic obstructive pulmonary disease.

The findings were published in *The Lancet* by researchers and pediatricians Drs. Francine M. Ducharme and Sze Man Tse following a review of the outcomes of clinical studies undertaken on preschoolers over close to 25 years. Wheezing is a symptom characterized by a whistling sound when breathing and it affects 20% to 25% of Canadian [children](#) under 6 years of age. Under-sixes visit the emergency three times more than all other age groups, resulting in at least one yearly [emergency department](#) visit for 2%-4% of them, a sizable number of whom will subsequently be admitted to hospital.

"Repeated wheezing is most often caused by asthma. However, the diagnosis is challenging because before 6 years of age, children are too young to go through the standard confirmatory [lung-function](#) test – spirometry," says Dr. Ducharme. "Yet the period before six years of age

is clearly a period of increased vulnerability and is probably the best time to intervene – and possibly – prevent lasting damage."

Damage resulting from lack of long-term therapy

These data track the natural evolution of the asthma, as today's ill adults were the preschoolers 20 to 40 years ago: at that time, few effective treatments were available. "Our study shows that the most effective treatment of young children is the long-term use of low doses of inhaled corticosteroids. However, it is alarming to see that few young children are currently receiving over the long term, this treatment that has been known to be effective. So even today, these children are at risk of long-term damage to their lung," says Dr. Ducharme.

The importance of diagnosis

In many cases, asthmatic children are wrongly diagnosed as having bronchitis or pneumonia. "This is why it's essential to correctly diagnose the causes of childhood wheezing," Dre Sze Man Tse says. "In other cases, due to a lack of information, doctors hesitate to prescribe long-term treatment, and parents hesitate to administer it. If these children were treated daily with inhaled corticosteroids, they would avoid repeated ER visits and their quality of life would be improved, as would their whole family's." It is not yet known if the treatment prevents long-term damage.

A public health priority

Genetic factors, colds, exposure to tobacco and very early childhood rapid weight gain are known [risk factors](#) for repeated wheezing. "Early intervention to reduce medium and long-term lung damage resulting from preschool wheezing should be a public health priority," says Dre

Ducharme. "Knowing that 48% of preschool children will wheeze at least once before the age of 6 years, and that a large proportion of them are improperly diagnosed or do not receive the inhaled corticosteroid whose effectiveness is well beyond any scientific doubt, we see in turn the great, needless expense for the health system and the risk of life-long, irreversible damage to these children."

Long-term preventative effect

CHU Sainte-Justine Hospital is one of few Canadian specialised paediatric centres that follows these patients with pulmonary function tests specially adapted for children 3 years and up, which enables their medication to be more carefully adjusted. "We can see these children's pulmonary function improve with treatment," says Dr. Ducharme. "We are currently studying whether the early and sustained administration of [inhaled corticosteroids](#) during childhood, the reduction of viral infections, and the control of various environmental factors before and after birth could have an effect on the occurrence, frequency or persistence of [asthma](#) until adulthood. These studies will also look at the financial impact of these interventions on health care costs."

More information: "Diagnosis, management, and prognosis of preschool wheeze." Prof Francine M Ducharme MD, Sze M Tse MD, Bhupendrasinh Chauhan PhD. *The Lancet* - 3 May 2014 (Vol. 383, Issue 9928, Pages 1593-1604) [DOI: 10.1016/S0140-6736\(14\)60615-2](https://doi.org/10.1016/S0140-6736(14)60615-2)

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