

# How to predict biphasic allergic reactions in children

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Children are more likely to have a repeat, delayed anaphylactic reaction from the same allergic cause, depending on the severity of the initial reaction. The first pediatric study to look at the predictors for this phenomenon was published today in *Annals of Allergy, Asthma & Immunology*.

Anaphylaxis is a [severe](#), allergic reaction that is rapid in onset and can result in death. Some children are at risk of delayed ('biphasic') anaphylactic reactions. Delayed reactions occur when the initial symptoms of allergic reaction go away but then return hours or days later without exposure to the initial substance that caused the reaction.

A study led at the Children's Hospital of Eastern Ontario (CHEO) Research Institute looked at the frequency and severity of biphasic [allergic reactions](#). From a sample size of 484 patient records, the incidence of biphasic reaction occurred in 15 percent of the study population, and two thirds occurred within six hours from the onset of the [initial reaction](#). At least half of the biphasic reactions were serious in nature, and required treatment with epinephrine.

The study unveiled that biphasic reactions were more likely to happen if the initial allergic reaction was severe or if it was not treated with epinephrine. Furthermore, the anaphylaxis tended to be more severe when the administration of epinephrine was delayed.

'The key message here for patients, parents, caregivers, teachers, and first-responder health professionals is: to prevent an [anaphylactic reaction](#) from worsening, administer epinephrine immediately after the onset of the early symptoms of an allergic reaction,' said Dr. Waleed Alqurashi, emergency medicine physician at CHEO, and assistant professor at the University of Ottawa. 'Our team has created an evidence-based prognostic tool so that physicians can monitor the

more serious cases appropriately.'

The team identified five independent, evidence-based [predictors](#) of biphasic reactions in children, including:

1. Delay in presentation to the Emergency Department (or delay in epinephrine administration) of more than 90-minutes from the onset of the initial allergic reaction
2. Wide pulse pressure at triage
3. Treatment of the initial allergic reaction with more than one dose of epinephrine
4. Respiratory distress that requires administration of inhaled salbutamol in the Emergency Department
5. Children between the ages of 6 to 9 years old

'It's clear that children with severe initial reactions would benefit from a prolonged period of observation in the Emergency Department,' continued Alqurashi. 'On the flip side, knowing what to look for helps to better utilize resources so that children with mild allergic reaction, who do not match any of the identified predictors can go home faster.'

The study entitled, 'Epidemiology and clinical predictors of biphasic reactions in children with anaphylaxis' includes clinical investigators and epidemiologists from the CHEO Research Institute, the Ottawa Hospital Research Institute, University of Ottawa, and Memorial University.

Researchers reviewed health records of patients who presented to the Emergency Department with anaphylaxis at CHEO and the Hospital for Sick Children (SickKids) based on the established diagnostic criteria of the National Institute of Allergy and infectious Diseases and the Food Allergy and Anaphylaxis Network.

Provided by Children's Hospital of Eastern Ontario  
Research Institute

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