



# ALLERGIES & ASTHMA EXPLAINED

**Immune diseases are on the rise,  
but so are effective treatment strategies**

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**CHANCES ARE** that you or someone you know suffers from allergic asthma, hay fever or eczema. Allergic diseases like these are very common in Canada. Recent estimates are that 30–35% of the population are affected by allergies and asthma!

Allergic disease comes in many forms, affects different organs and tissues, and causes a variety of symptoms that vary in severity from mere annoyances to life-threatening reactions. But in spite of their diversity, all allergies share the same basic mechanism: a change in the normal regulation

of the immune system that causes it to react to environmental substances that would normally be harmless.

### The normal immune system

The normal function of the immune system is to protect your body from potentially harmful infections, like viruses or bacteria. When they're detected, the immune system develops specialized white blood cells to help eliminate them. Some of these, called B cells, produce antibodies that attach to the infectious agent (the virus or bacteria) and "flag" it for elimination.

Even after the bacteria or virus has been eliminated, the B cells and antibodies linger in your body as a memory, so if you're re-exposed to the same infectious agent, your immune system will be activated more quickly the second time and eliminate the agent before it can cause harm.

### Allergies and the immune system

Most of the time, our immune responses are triggered by harmful agents like bacteria or viruses. But for reasons that aren't totally clear, many people have immune systems that mistakenly respond to environmental substances that are not harmful, resulting in allergies.

Allergies all have one thing in common: they cause the immune system to produce a specialized antibody — Immunoglobulin E or IgE — that binds to the substance to which you are allergic (called an allergen). IgE is special because it attaches itself to mast cells, which are present on many of the body's surfaces.

When you're re-exposed to the allergen, it binds to IgE that then stimulates the mast cells to release their contents. Many of these contents are responsible for the symptoms of the allergic response. This causes immediate symptoms and, because the immune system has a "memory," these responses will be generated each time you're exposed to the allergen.

The outcome of these responses depends on where in the body they take place. Allergic disorders can affect the nose (allergic rhinitis or hay fever), skin (eczema), eyes (allergic conjunctivitis), lungs (asthma) and other body systems such as the gastrointestinal tract (food allergy).

### Allergies and asthma

While 30% of adult-onset asthma cases are triggered by allergies, many people with allergies don't have

asthma, and some types of asthma aren't associated with allergy. Allergic asthma is a form of disease that affects the lungs and airways. When people with allergic asthma breathe in an allergen, it triggers a reactivation of the immune response. Mast cells release chemical cells that cause immediate effects such as airway narrowing, leading to wheezing, shortness of breath and mucous production.

These short-term events also trigger the initiation of late-onset responses, including the entry of white blood cells into the lungs, which can cause further damage and irritation. Over time, these responses can cause permanent changes to the way the lungs function.

Non-allergic asthma is triggered by factors not related to allergies, such as anxiety, stress, exercise, cold air, dry air, hyperventilation, smoke, viruses or other irritants. Like allergic asthma, it produces airway obstruction and inflammation with symptoms like coughing, wheezing, shortness of breath or rapid breathing, and chest tightness. However, the immune system is not involved in the same way as in allergic asthma.

### What causes the development of allergies?

Allergies likely result from a complex interplay between genes and the environment. However, it's a very complicated picture, and the relative importance of each of a variety of factors has yet to be determined. ▶

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Clearly, genes play a role in determining susceptibility to allergy. If both your parents have allergies, you have a significant chance of also having them. However, there's no single "allergy gene," and the genetic predisposition probably results from the collective effects of many different genes.

It's equally clear that environmental factors contribute to the development of allergies. Allergies have become much more common over the last century, and changes in our environment and lifestyle are likely responsible. Some research suggests that our decreased exposure to infection (due to improved sanitation, immunization, smaller family size and increased use of antibiotics and household antimicrobial products) has limited our exposure to infections that might have protected us from allergic responses; this is widely known as "the hygiene hypothesis."

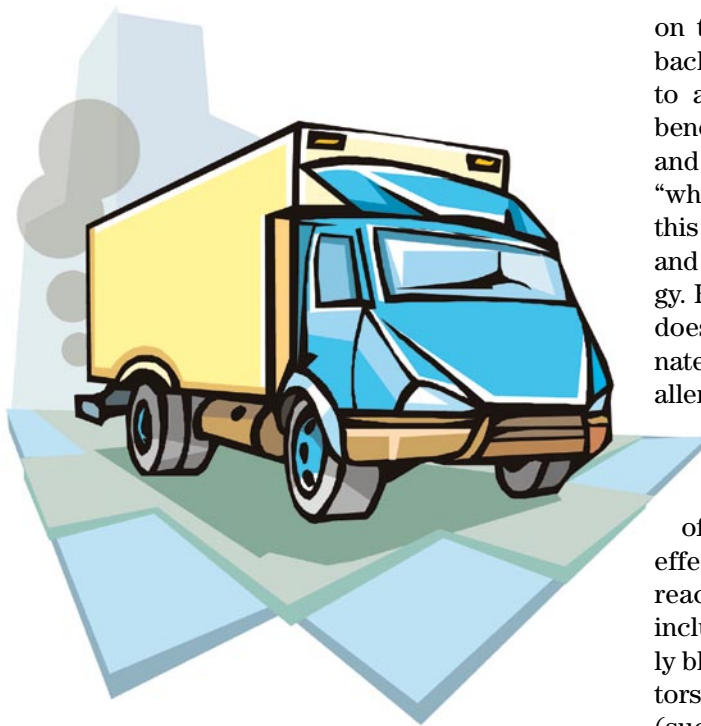
Other studies indicate that air pollution, especially from cigarette smoke and traffic exhaust, may play a role in initiating allergies.

Further research is required to develop a more comprehensive understanding of the relationships between these possible factors and the development of allergic diseases.

### Treatment & management

Although there's no cure for allergies or allergic asthma, there's little need to suffer with symptoms. Today, there are many different effective medications to treat allergy symptoms.

An important strategy for managing allergic diseases is to try, when possible, to reduce your exposure to trigger substances. Even if you can't avoid the substances completely, limiting exposure may reduce your dependence on medications to control the symptoms. If you don't know what you're allergic to, ask your doctor to refer you to an allergist for testing. Allergies are diagnosed by skin testing. This entails placing drops of liquid containing individual allergens



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on the skin of the arm or back, and pricking it lightly to allow the liquid to get beneath the skin. If a bump and red area develop (a "wheal and flare" reaction), this is a positive skin test, and may indicate an allergy. But a negative response doesn't completely eliminate the possibility you're allergic to that substance.

When it's impossible to avoid exposure to allergens, a variety of treatment options can effectively minimize your reaction to them. These include drugs to specifically block some of the mediators that cause symptoms (such as antihistamines or leukotriene inhibitors); medications that inhibit the overall inflammatory response (corticosteroids); medications to help open narrowed airways ( $\beta$ -agonists); and allergen immunotherapy, also known as allergy shots, to desensitize your immune system. There are steroid inhalers

for both allergic and non-allergic asthma and nasal steroid sprays for rhinitis. Today's antihistamines don't cause drowsiness in most people, and inhalers and nasal sprays allow corticosteroids (potent anti-inflammatory medication) to be targeted to the site of symptoms such as the nose or lungs, rather than giving larger doses to the entire body. Your doctor will be able to help you decide which forms of treatment are right for your particular situation, and devise a treatment plan that involves one or more of these approaches.

### Don't let allergies keep you down

The most important step for anyone who thinks they might have allergies or allergic asthma is to talk to a doctor. Although there's no cure, these diseases can usually be controlled with appropriate treatment. Your doctor will be able to arrange for tests to see what you're allergic to, review various treatment options with you and recommend ways for you to minimize the impact of allergies on your life. 