



Asthma

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Asthma is an inflammatory condition which affects the bronchial tubes in the lungs. People with asthma have sensitive or hyperactive airways which narrow in response to certain stimuli. The narrowing is due to inflammation and swelling of the lining, tightening of the airway muscles (spasm) and production of excess mucus. This reduces the airflow in and out of the lungs.

Asthma is a widespread and chronic health problem in Australia with over 2 million Australians suffering from it. Asthma affects up to 14% of children and up to 12% of adults and is estimated to cost the community \$700m per year in direct costs. The prevalence of asthma in Australia has risen significantly through the 1980s and 1990s and remains high by international standards. As management has improved, fewer people die from asthma (around 300 a year currently) but it is still a common reason for hospital admission and emergency department visits in children.

What are the symptoms of asthma?

The symptoms of asthma may vary from person to person, and from time to time. Some people may have all these symptoms while other people may only have a wheeze or cough.

- Tightness in the chest
- Shortness of breath
- Wheezing – a high pitched raspy sound on breathing
- A dry, irritating, persistent cough, particularly at night, early morning, with exercise or activity

What causes asthma?

The causes of asthma are still not clearly understood, but genetic and environmental factors come into play. There is often a family history of asthma, eczema and/or hay fever or other allergies. Children with one asthmatic parent are three to six times more likely to develop asthma. In 2004, two asthma genes were discovered on chromosome 7p, as well as a protein-coupled receptor for asthma susceptibility.

However, inheriting genes for asthma does not necessarily mean you will get it. It is the combination of genetic susceptibility and environmental factors that is thought to trigger asthma:

- Inhaled allergens such as pollen or dust mites and irritants such as perfumes or cleaning fluids
- Exposure to cigarette smoke (either in utero or in childhood)
- Infection with a cold or flu
- Changes in temperature or weather

Nearly 25% of people with asthma are smokers, and approximately 40% of asthmatic children live with someone who smokes. Vigorous exercise can also trigger the symptoms of asthma (known as exercise-induced asthma).



"Over 2 million Australians have asthma."

"40% of children with asthma live with people who smoke."

"Nearly 25% of people with asthma are smokers."



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How is asthma managed?

Asthma management, treatment and education have all improved enormously over past years, however unfortunately there is still no cure. Avoidance of exposure to triggers and development of an asthma action plan, in consultation with a GP or specialist, are critical. The plan sets out day-to-day procedures to maintain health, typically through the regular use of inhaled or oral preventive medication to lessen the sensitivity of the airways and dry up mucus. The plan will also include measures to take when a cold or infection strikes or at the first signs of asthma, which usually involves the use of inhaled medication for quick relief of symptoms. Combined preventative and relief (symptom controlling) medication also exist in the same delivery device. The aim is to achieve optimal control of asthma for each person and the best quality of life possible.

What research is Garvan doing in this area?

The Garvan Institute is a partner in the Cooperative Research Centre for Asthma and Airways (CRCAA), established in 2005. The CRCAA's research program is focused on understanding the key pathways in asthma and identifying unique sets of genes, inflammatory molecules and proteins that can be used to intervene in the process of asthma. For example, a chemical called $\alpha 2$, initially thought to be only present in fat cells, has been discovered to also be present in very high amounts in allergic lungs. It plays an important role in controlling asthma, and thus is a potential asthma drug development target.

Garvan is also looking into developing new therapeutic approaches for asthma, such as monoclonal antibodies as a treatment to reduce inflammation in the airways of asthma patients.

Research into diagnostics is also important: more effective tools to identify which patients will respond best to which treatments. Research at Garvan, together with the CRCAA, will lead to more effective use of existing treatments and the development of novel and improved therapies.

Further sources of information

Asthma Foundations of Australia

www.asthmaaustralia.org.au

CRC for Asthma and Airways

www.asthma.crc.org.au

Asthma Foundation of NSW

www.asthmansw.org.au

National Asthma Council Australia

www.nationalasthma.org.au

Garvan Institute of Medical Research – how you can get involved

The Garvan Institute of Medical Research was founded in 1963. Initially a research department of St Vincent's Hospital in Sydney, it is now one of Australia's largest medical research institutions with approximately 500 scientists, students and support staff. Garvan's main research areas are: Cancer, Diabetes & Obesity, Immunology, Osteoporosis & Bone Biology and Neuroscience.

Your support makes it possible for the Garvan scientists to continue their great work. You can help by making a donation or a bequest, holding a community fundraiser or volunteering your time for Garvan. For details on how to get involved, please visit www.giving.garvan.org.au or contact our Supporter Services Manager on (02) 9295 8110.

Education is one of Garvan's top priorities. Our Public Engagement Coordinator can visit your community group or school to give a talk on a number of science and health related topics. Garvan also offers regular tours of our facilities. For further details, visit our website or call (02) 9295 8108.

Garvan Institute of Medical Research
384 Victoria Rd Darlinghurst NSW 2010
(02) 9295 8110 www.garvan.org.au

