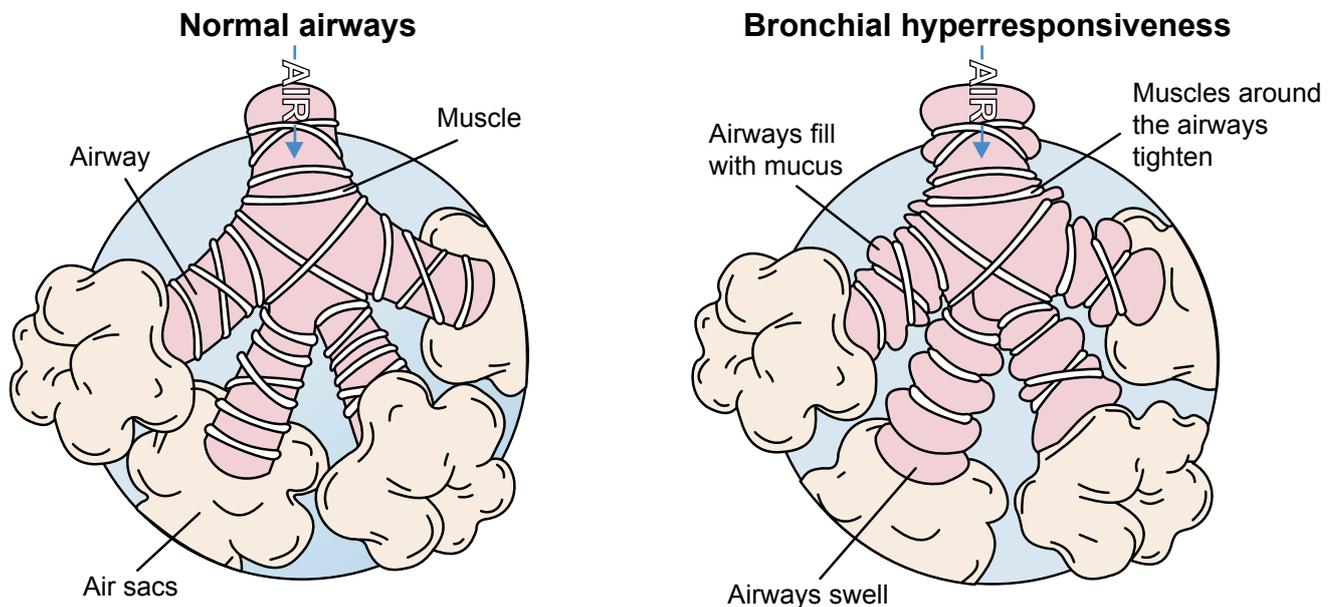




## Asthma in elite athletes

This factsheet attempts to explain the increased occurrence of asthma and bronchial hyperresponsiveness among elite athletes, and give information about recommended treatment and testing regulations.

Exercise-induced asthma and bronchial hyperresponsiveness (BHR) have become increasingly common in top athletes, particularly those who compete in endurance sports. BHR is a measure of how easily the airways constrict or become narrow in response to different stimuli such as: physical exercise; viral infections; smells and cold or dry air.



The widespread use of asthma drugs, particularly inhaled  $\beta_2$ -agonists, among top athletes has led the International Olympic Committee Medical Commission (IOC-MC) and the World Anti-Doping Association (WADA) to restrict their use to athletes who have been diagnosed with asthma and show evidence of BHR.

Elite athletes may have had asthma since childhood or they may have developed asthma and BHR since becoming active in sports. Asthma and BHR occur most often in endurance sports such as cross-country skiing, biathlon and swimming, particularly in older athletes.

Endurance sports require a high level of fitness and stamina to enable the body to keep exercising for a long time. As you exercise, your breathing will get faster to ensure the body has enough oxygen to keep going. Athletes may inhale potentially harmful substances in the air, depending on the environment, which may cause asthma symptoms or damage the lungs directly.

**Photo:** Marit Bjørgen, asthmatic Olympic gold medallist in cross-country skiing.



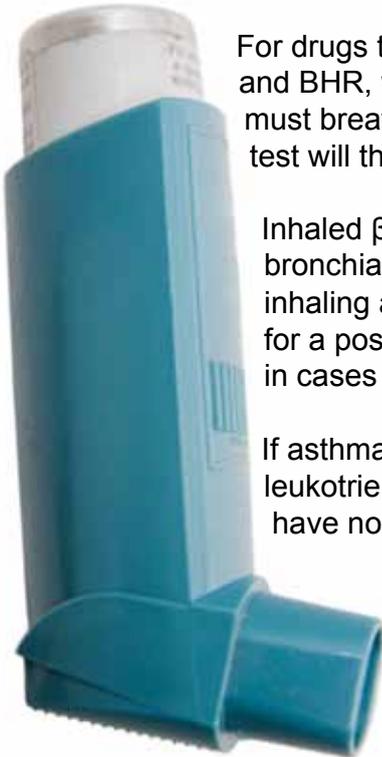
Photo by Bjarte Hetland

**Examples of potentially harmful substances that are inhaled in different sports:**

Sport	Potentially harmful substances
Cross-country skiing Biathlon Nordic combined	Cold, dry air
Swimming	Organic chlorine chemicals (chloramine and trichloramine)
Figure skating Speed skating Ice hockey	Nitrogen oxide from freezing machinery Ultrafine particles from polishing machines

**Treatment and approval of medication**

Most drugs can be used by athletes with documented asthma, except systemic steroids, systemic  $\beta_2$ -agonists and other adrenergic drugs. These drugs have strict rules that athletes must follow if they decide to take them. If an athlete declares that they are using inhaled steroids and some inhaled  $\beta_2$ -agonists (salbutamol and salmeterol) approval is not required.



For drugs that need to be approved, athletes must show clinical signs of asthma and BHR, which must be confirmed with a bronchial challenge test. In this test you must breathe in a drug which makes your airways become narrow. A lung function test will then show how much they have narrowed.

Inhaled  $\beta_2$ -agonists are only approved if a positive result is shown with a bronchial challenge test or if lung function increases by more than 12% after inhaling a bronchodilator ( $\beta_2$ -agonist). Asthma must be at least moderately severe for a positive result to be shown in these tests. Tests often show negative results in cases of mild asthma.

If asthma symptoms are shown but the tests do not show positive results, leukotriene antagonists or ipratropium bromides can be used, as these drugs have no restrictions.

Mild asthma can be treated with anti-inflammatories such as inhaled steroids. These counteract any harm caused by sport and reduce the risk of long term injury.

By giving an asthmatic athlete the best treatment, they have a better opportunity to compete on equal terms with other non-asthmatic athletes. Many studies have demonstrated that inhaled  $\beta_2$ -agonists and inhaled steroids do not improve performance or offer any benefit to non-asthmatic athletes. However, all athletes who compete at an international level must provide up-to-date information on their asthma treatment.

If you are an elite athlete competing at an Olympic or professional level, you must ensure that your current treatment is permitted by authorities. If you experience asthma symptoms and suspect that you need treatment, visit your doctor and ensure you are treated within the current guidelines.



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The ELF is the public voice of the European Respiratory Society (ERS), a not-for-profit medical organisation with more than 10,000 members in more than 100 countries. The ELF is dedicated to lung health throughout Europe, and draws together the leading European medical experts to provide patient information and raise public awareness about respiratory disease.

This material was compiled with the help of ERS asthma expert, Prof. Kai-Hakon Carlsen.