

Preventing exercise-induced bronchospasm

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A team of researchers in Italy have explored previous research to find the best ways to identify, prevent and treat exercise-induced bronchospasm (EIB) in children with and without asthma. In EIB, the airways become constricted during and after exercise, and effective treatment could allow children to fully enjoy the benefits of exercise.

Getting plenty of [exercise](#) is important for childhood development and previous research has shown that it has positive psychological and physiological effects in children, along with long-term effects on conditions such as obesity. EIB happens when the airways become constricted during and after exercise, potentially limiting the amount of exercise someone can do.

EIB is very common in children, with some studies reporting that up to 45% of children may be affected. Up to 90% of people with asthma suffer EIB, but people with no asthma can also be affected. Other factors that can trigger EIB include respiratory infections, allergies and environmental factors such as humidity and temperature.

So, what causes EIB? Researchers think that losing heat and moisture from the lungs during exercise causes white blood cells to release a cocktail of inflammatory proteins that make the airways narrower, causing shortness of breath and wheezing. This can happen rapidly, and symptoms generally appear within a few minutes of starting exercise. People with asthma tend to have higher numbers of white blood cells and more inflammation in their lungs, making them particularly susceptible.

EIB can make exercise difficult or impossible, a fact that motivated Serena Caggiano, a researcher at Bambino Gesù Children's Hospital in Rome, to identify the most effective EIB treatments for a recent study in *Frontiers in Pediatrics*. "In children, EIB can reduce quality of life and participation in sport. Our motivation was to identify the right treatment and prevention strategies so that children with EIB can take part in physical activities," says Caggiano.

As methods to identify, prevent and treat EIB can vary quite a lot from place to place, the researchers searched the literature to find the most successful methods, to help doctors make the best choices.

They identified that the best way to diagnose EIB involves an exercise challenge, where patients run or cycle to get their heart rate up. After the task, measuring how much air the patients can exhale in a forced breath lets doctors know if they have EIB and how severe it is. The researchers emphasize that it is important to distinguish between EIB and other respiratory diseases, to make sure that doctors use the most appropriate treatments.

The research team identified some of the most effective pharmacological treatments, and these include drugs that children can inhale before exercise, which inhibit specific [white blood cells](#) in the lungs, or relax muscles in the airways, making breathing easier. In their study, they highlight the correct drugs and drug combinations to take depending on the severity of the disease.

However, the team also present several practical preventative methods that can reduce EIB. These include wearing a face mask during exercise to help humidify inhaled air, performing a gentle warm-up before exercise to reduce the cooling effect of cold air in the lungs and selecting exercises such as indoor swimming that avoid cold, dry air in favor of warmer, moister air. Parents and teachers can help [children](#) at risk from

EIB to use these simple preventative methods.

The team's advice is invaluable for parents, teachers, doctors and scientists. "By presenting the strengths and limitations of current approaches, this study should help researchers to develop new diagnostic tests and optimal treatments and help doctors to optimize and standardize EIB [treatment](#)," says Caggiano.

More information: Serena Caggiano et al, Exercise-Induced Bronchospasm and Allergy, *Frontiers in Pediatrics* (2017). [DOI: 10.3389/fped.2017.00131](#)

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