

Childhood ASTHMA

Summertime can be a breathtaking experience for children with asthma.

Vigorous exercise, campfire smoke, chlorinated pools, air pollution, pollen and changes in humidity—they're all factors that can provoke an asthma attack. Add them to a long list of year-round asthma triggers such as tobacco smoke, respiratory infections and allergies, and the world can be a dangerous place for asthmatic children.

"Asthma is a leading cause of chronic illness in children, accounting for more missed days of school and hospitalizations than any other condition," says **Dr. Dan Cooper**, a pediatric pulmonologist and researcher with University of California, Irvine Healthcare. The disease causes the airways in the lungs to narrow, making breathing difficult. Furthermore, if the lungs are inflamed for a long period, the delicate tissues in the airways can change permanently, leading to chronic lung disease.

Fortunately, proper treatment can help control symptoms and prevent dangerous episodes. "Children with asthma typically receive a low daily dose of an inhaled corticosteroid to reduce inflammation," says Cooper. The prescribed medications have few side effects and are considered safe for pediatric patients older than age 3. Short-acting bronchodilators or "rescue" medicines, which relax the airways, are needed when symptoms flare.

Exercise-provoked asthma. Researchers are trying to understand the underlying causes of the disease. "We've learned that children with asthma have an abnormal inflammatory response," says Cooper. "This has led to enormous advances in treating asthma symptoms. But the basic reason for asthma is still a mystery."

The recipient of a \$7.2 million National Institutes of Health grant, Cooper and his colleagues are investigating how vigorous physical activity—one of the leading causes of asthma attacks—affects the immune systems of children. "Up to 90 percent

of children with asthma will have an exercise-provoked attack," says Cooper. "On one hand, aerobic exercise stimulates the immune system and is necessary for normal growth and development. On the other hand, vigorous physical activity can lead to asthma attacks, especially when air pollution and allergies are also present."

Wheezing puzzle. Studies are conducted through the UC Irvine Pediatric Exercise Research Center, which Cooper directs. Laboratory research focusing on exercise is particularly valuable because it allows medical scientists to study a well-known asthma trigger in a controlled setting.

The basic cause of asthma is still a mystery that needs to be solved.

"Unlike viruses or changes in the weather, exercise is one factor that we can reproduce with certainty in the laboratory," explains Cooper. He hopes these studies will lead to better treatments for childhood asthma by clarifying why non-asthmatic children don't wheeze when they exercise—and what protects them from this troublesome problem. Cooper's work is complemented by the studies of UC Irvine epidemiologist **Dr. Ralph Delfino**, who is investigating how air pollution influences asthma. Additionally, UC Irvine biomedical engineer **Dr. Steve George** is developing noninvasive tools to assess asthma by examining gases in exhaled breath.

Cooper notes that it is important for pediatric asthma patients to remain physically fit. "Although most children with mild to moderate asthma can



participate in a physical activity program, those with more severe cases must learn to minimize the possible negative effects of exercise," says Cooper. This requires a close partnership of families, doctors, coaches, teachers and school nurses. Everyone should be well informed about exercise-induced asthma. They should also make sure the condition isn't ignored when it occurs and insist that children take their asthma medications in a timely manner. "The sooner treatment begins, the less likely the attack will lead to seriously compromised breathing," says Cooper. For more information, visit www.ucihealth.com.

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