

Air-pollution expert explains how to take care of your lungs during ozone season

April 22 2010, by Sara Peach

(PhysOrg.com) -- April's warm, sunny days mark the beginning of ozone season. UNC Health Care expert David Peden, MD, the director of the Center for Environmental Medicine, Asthma and Lung Biology at the UNC School of Medicine, explains what his research shows about ozone pollution and how you can protect yourself.

It's a harmless-looking pale blue gas, a relative of the oxygen molecule that sustains life. In the upper atmosphere, a layer of it protects us from the sun's harmful rays.

But ozone molecules, composed of three oxygen atoms, can trigger breathing problems when they form near the ground, said David Peden, MD, director of the Center for Environmental Medicine, Asthma and Lung Biology at the UNC School of Medicine.

[Ozone pollution](#) is more common during “ozone season,” which begins in April and peaks in the warm summer months. Ozone forms on hot, sunny days when pollutants from car exhaust, power plants, gas stations and industrial facilities undergo chemical reactions in sunlight. Meanwhile, the stagnant weather systems that often form in summer can trap pollution around a community.

More than half of North Carolina's residents live in counties where ozone levels sometimes reach unhealthy levels, according to the N.C. Department of Environment and Natural Resources. Children, people with [respiratory diseases](#) and healthy adults who exercise or work

outdoors are at risk.

Peden investigates the health effects of ozone at the [Environmental Protection Agency](#) Human Studies Facility located on the UNC-CH campus. His team uses controlled chambers to expose volunteers to varying levels of [air pollutants](#). That research has shown that exposure to ozone inflames the lungs, which can aggravate other breathing problems.

“Those changes can exacerbate other issues,” he said. “The person is subsequently more likely to have an [asthma attack](#) or be more reactive to allergens.” Those responses often do not appear until the day after ozone exposure, he said.

In addition, Peden said that a study of southern California children suggested that long-term, chronic exposure to ozone may affect lung development. Ozone may also be linked to cardiovascular disease, an area of research that Peden is now pursuing.

To protect themselves on elevated-ozone days, Peden said individuals should avoid outdoor air in the afternoon, when ozone levels peak.

“Do most of your vigorous outdoor work in the morning or in the evening, after the ozone has decreased,” he said.

But Peden said health experts learned an important lesson about ozone pollution from the 1996 Summer Olympics. During the games, Atlanta city officials aggressively restricted downtown traffic. A group of researchers found that during the 17 days of the games, ozone pollution decreased. Meanwhile, the number of severe asthma attacks fell by 40 percent.

That study, Peden said, shows the importance of public health measures, such as pollutant regulations, to protecting air quality.

“If we're going to really address this, it's going to be through public-policy efforts,” he said.

More tips for healthy lungs

- Check your weather forecast for ozone predictions. In North Carolina, a Code Orange day means the air is unhealthy for sensitive people. A Code Red ozone day indicates that everyone should avoid breathing outdoor air.
- If you have access to an indoor gym, exercise there when ozone levels are high. Or try walking inside a mall or other enclosed space.
- If you have asthma, work with your doctor to keep it under control throughout the year so that you have fewer problems during ozone season.
- Peden said some studies suggest that eating food rich in antioxidants, such as blueberries, beans and pecans, may reduce the effects of ozone exposure.
- It's likely that breathing other pollutants can make ozone exposure worse, Peden said. So keep away from cigarette smoke, and try to quit if you are a smoker.

Provided by University of North Carolina at Chapel Hill School of Medicine

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