

PROMOTING HEALTHY  
ENVIRONMENTS FOR CHILDREN

# Outdoor Air Pollutants



## KEY POINTS

- Ambient air pollution is increasingly recognized as a preventable risk factor for a spectrum of pediatric health concerns.
- Air pollution exposures are widespread, and children are uniquely vulnerable, because they spend more time outside and breathe faster (inhaling more pollutants per pound of body weight) than adults, and because their bodies are still developing.
- Current levels of air pollutants are associated with many pediatric morbidities, including asthma incidence and prevalence, adverse birth outcomes, behavioral and cognitive development, and pediatric cancers, as well as with increased risk for a range of chronic diseases in adult life.
- Negative effects start during preconception and can last through childhood and adulthood.
- People from racial and ethnic minority groups, and low-income communities are disproportionately exposed to air pollution through geographic proximity vehicular traffic and polluting industrial facilities. Improving air quality is an environmental justice and child health equity imperative.
- Exposure to air pollution during pregnancy may lead to low birth weight, small size, and preterm birth.

## CLINICAL GUIDANCE

Outdoor air pollution consists of a complex mixture of pollutants found in ambient air. Exposure occurs when children breathe, but pollutants are also found in contaminated soil, water, vegetation, and fish. Preventing exposure, most importantly reducing sources of air pollutants, can lead to improved health outcomes.

- Recognize air quality concerns and resources in your practice area and for individual patients.
- Advise families to work with schools to reduce exposure to diesel exhaust from idling school buses.
- Be aware that children may experience worsening asthma symptoms, wheezing and coughing, decreased lung function, and upper airway infections due to increased exposure to outdoor air pollutants.
- Help families of children with asthma to assess their environment for asthma triggers and develop a plan for minimizing exposure to these triggers, including air pollutants
- Offer families resources about the local air quality index (AQI) which can be found online at <https://www.airnow.gov>, in weather apps, or the local newspaper.

- Use the AQI as a tool in educating families about potential protective behaviors, including curtailing outdoor physical activity when air quality is poor. On summer days when ozone levels are expected to be high, outdoor activities can preferentially be scheduled in the morning, as levels in the summer tend to be highest in the afternoon. The AQI may be most useful in especially vulnerable patients with medical risk factors, including pregnant people, young children, children with asthma, and children with a history of preterm birth.
- Serve as a role model and practice model in reducing contributions to poor air quality by using and promoting active transport (eg, walking, cycling) and alternative transportation to gasoline-powered motor vehicles.

### **BACKGROUND INFORMATION**

By 2016, approximately 300 million children worldwide were living in areas with extreme outdoor air pollution. The categories of pollutants include:

- Criteria pollutants that come from power plants, motor vehicles, industrial operations, burning organic materials, coal, smelters, and pulp and paper mills. (The [Clean Air Act](#) requires the US EPA to set National Ambient Air Quality Standards for 6 [Criteria Air Pollutants](#) which can be harmful to public health and the environment. The criteria pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.)
- Toxic air pollutants from vehicle exhaust, large and small industrial facilities, indoor sources, volcanoes, and forest fires.
- Greenhouse gases (GHGs), which are heat-trapping gases released in the atmosphere primarily from burning fossil fuels. GHGs are responsible for climate change, a significant threat to children's health and well-being.

The Clean Air Act and its amendments set standards for air pollutants; regulate geographic areas with poor air quality, cars, trucks, and greenhouse gases; and reduce toxic air pollutants.

### **FOR MORE INFORMATION**

The following resources offer additional information regarding outdoor air pollutants:

- [Ambient Air Pollution: Health Hazards to Children](#) – AAP Policy Statement
- [Pediatric Environmental Health, 4<sup>th</sup> Edition](#) – AAP Policy Manual
- [Air Now](#) – Air Quality Index (AQI)
- [Learn about the Particle Pollution and Your Patients' Health](#) – US EPA
- [Patient Exposure and the Air Quality Index](#) – US EPA
- [American Lung Association](#)
- [EJSCREEN: Environmental Justice Screening and Mapping Tool](#) – US EPA
- [Envirofacts](#) – US EPA
- [Toxic Release Inventory](#) – US EPA
- [Criteria Air Pollutants](#) – US EPA