

# Air pollution bad for kids' brains

*This article originally appeared on Dr. Galland's website, PillAdvised.*

A small imaging study suggests prenatal exposure to polycyclic aromatic hydrocarbons (PAHs), the toxic air pollution caused in part by vehicle emissions, coal burning and smoking, may be bad for children's brains and may contribute to slower processing speeds and behavioral problems, including attention-deficit-hyperactivity-disorder (ADHD) symptoms, according to an article published online by JAMA Psychiatry.

PAHs are caused by the incomplete combustion of organic materials. In addition to outdoor air pollution, sources of indoor air pollution caused by PAHs can be cooking, smoking and space heaters. PAHs can cross the placenta and damage fetal brains and animal experiments suggest prenatal exposure can impair behavior and learning, according to study background.



Bradley S. Peterson, M.D., of Children's Hospital Los Angeles, and coauthors conducted an imaging study that included urban school-aged children born to Latin (Dominican) or African American women. The children were followed from the fetal period to ages 7 to 9 years old. Their mothers completed prenatal PAH monitoring and prenatal questionnaires.

The authors found an association between increased prenatal PAH exposure and reductions in brain white matter in children later in childhood that was confined almost exclusively to the left hemisphere of the brain and involved almost its entire surface.

Reduced white matter surface on the left side of the brain was associated with slower processing during intelligence testing and behavioral problems, including ADHD symptoms and conduct disorder problems, according to the results.

The authors note the small size of their study as well as other limitations in the research. "If confirmed, our findings have important public health implications given the ubiquity of PAHs in air pollutants among the general population," the study concludes.

**Reference:** *"Effects of Prenatal Exposure to Air Pollutants (Polycyclic Aromatic Hydrocarbons) on the Development of Brain White Matter, Cognition, and Behavior in Later Childhood Effects of Prenatal Exposure to Air Pollutants (Polycyclic Aromatic Hydrocarbons) on the Development of Brain White Matter, Cognition, and Behavior in Later Childhood,"* Bradley S. Peterson, MD; Virginia A. Rauh, ScD; Ravi Bansal, PhD; Xuejun Hao, PhD; Zachary Toth, BA; Giancarlo Nati, BA; Kirwan Walsh, BA, Rachel L. Miller, MD; David Semanek, BA; Frederica Perera, DrPH, PhD. JAMA Psychiatry. March 25, 2015.

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