

AIR TOXICS AND CHILD HEALTH IN PORTLAND: A GUIDE FOR CLINICIANS



*This fact sheet will help health care providers understand data from the **Portland Air Toxics Solutions (PATS)** project and its relevance to patients, clinicians, and the community.*

What is PATS?

- The Department of Environmental Quality (DEQ) recently conducted a modeling study to estimate air toxics concentrations for Portland into the year 2017. The study model used the most current and detailed emissions information from businesses and industry, cars and trucks, and residential activities. This information came from both measured and estimated emissions. The model also factored in economic conditions, population growth, topography, weather, and new regulations to reduce pollution.
- The study is part of DEQ’s ongoing effort to understand the sources, concentrations and locations of air toxics in the Portland area and provides information at the neighborhood level for key air toxics in portions of Multnomah, Washington, and Clackamas counties.
- The study includes a health risk assessment comparing modeled concentrations to health based benchmark levels.

What are the air toxics?

- “Air toxics” are air pollutants known or suspected to cause serious health problems. PATS assessed 19 air toxics.
- The most significant sources of these air toxics are residential wood combustion, motor vehicle emissions, and construction equipment.

Child health and PATS

- Children’s risk of cancer is associated with cumulative exposure to environmental carcinogens and gene-environment interactions during their growth and development. Many of the air toxics have carcinogenic properties and some are established human carcinogens.
- Asthma is one of the most common chronic conditions affecting children. Many of the air toxics have irritant properties that may worsen asthma status for children already diagnosed with asthma, and some of the air toxics are associated with the development of asthma.
- Fetal growth and development may be particularly vulnerable to air toxicant effects, which manifest as adverse birth outcome such as spontaneous abortion, low birthweight, or congenital anomalies.
- Based on prevalence of exposure concentrations above health benchmarks, the four air toxics causing the significant risk across Portland are **benzene, diesel particulate matter, polycyclic aromatic hydrocarbons (PAH, tar-like byproducts from incomplete burning of carbon-containing substances), and acrolein:**

<i>Pollutant</i>	<i>Major child health concern</i>	<i>Major Sources</i>
Benzene	Cancer (leukemia)	Traffic emissions, off road engine emissions, wood burning
Diesel particulate	Cancer (lung), asthma exacerbation and incident asthma	Traffic emissions, off road engine emissions
PAH	Cancer	Wood burning
Acrolein	Respiratory tract irritation, asthma exacerbation	Wood burning, secondary formation

- The other fifteen air toxics of concern assessed by PATS include: 1,3-butadiene, acetaldehyde, arsenic, formaldehyde, nickel, perchloroethylene, naphthalene, cadmium, ethylbenzene, manganese, chromium VI, dichlorobenzene, methylene chloride, lead, and trichloroethylene.
- In addition to area-wide air toxics (such as benzene, diesel particulate matter, polycyclic aromatic hydrocarbons, and acrolein), if people live within ¼ mile of an industrial point source that is emitting air toxics, those “point source” toxics may also be relevant to their health.

PATS and your clinical practice

✓ Promote patient behaviors that reduce their exposure to air pollutants

- People can reduce their personal exposure to air toxics by:
 - Eliminating smoking
 - Avoiding exercising outside close to highly congested roadways
 - Switching their heat source from wood or oil (ex. low-efficiency furnaces) to natural gas or propane
- Concerned individuals can also improve community-level air quality by:
 - Eliminating tobacco use
 - Driving less and decreasing idling
 - Decreasing use of wood burning appliances
 - Decreasing use of dry cleaning, household solvents, and pesticides
 - Promoting policies that reduce residential and school proximity to congested roadways
- For more general information, the DEQ’s online resources can be accessed at <http://www.oregon.gov/DEQ/AQ/>. [Airnow.gov](http://www.airnow.gov) provides daily local air quality forecasts.

✓ Understand the role of medical tests or treatment

- Biomarkers of exposure measure chemicals or their metabolites in biological specimens (typically urine or blood) to assess an individual’s uptake of air toxics.
- Air toxics exposure biomarkers are primarily used in research settings. Many commercially available “toxicity tests” are not reliable, accurate, or interpretable. Clinicians or patients are encouraged to contact the NW PEHSU or a board certified clinical toxicologist/occupational medicine physician for selection and appropriateness of environmental tests in medical evaluation for environmental contaminants.

For more information on all of the PATS air toxics

- PATS results and explanatory materials are available to the public on the DEQ air toxics website: <http://www.deq.state.or.us/ag/>.
- The Agency for Toxic Substances & Disease Registry (ATSDR) offers fact sheets (ToxFAQs) on various hazardous substances: <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

Getting involved beyond clinical practice

- Health care providers are highly respected voices on community health concerns. Interested clinicians can have an impact on reducing air toxics by serving as advisors and health communication partners with government agencies, or as community health advocates.
- Contact the Physicians for Social Responsibility (<http://www.psr.org/chapters/oregon/> or 503-274-2720, info@oregonpsr.org) to identify opportunities.

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