

HEALTHCARE PROVIDER GUIDE: Traffic-related air pollution



Goal: To inform and equip Puget Sound clinicians in counseling pregnant patients and other sensitive groups about the risks from car and truck pollution.

Why?

Multiple studies suggest that living near busy roads and the pollution that is caused by cars and trucks is not healthy, and some patients are particularly vulnerable.

Who is at risk?

- **Expectant mothers** – Maternal exposure to traffic pollution is linked to low birthweight, prematurity, development of pediatric asthma, and possibly fetal and infant mortality.
- **Children** – Children are at increased risk because their lungs are still developing and often spend more time outdoors at higher activity levels than adults. Traffic-related pollutants are associated with risk of respiratory infection and respiratory symptoms such as otitis media, bronchiolitis, cough, and wheeze. Living near traffic pollution is linked to reduced lung function growth.
- **People with compromised cardiopulmonary health (e.g. COPD, CVD, Asthma)** – when exposed to air pollution, these groups have an increased risk of disease exacerbation and acute events including stroke, heart attack, and premature death.
- **Undiagnosed older adults** – have an increased risk of hospitalization due to heart or lung diseases.

What types of pollution come from cars and trucks?

Traffic emissions include a complex mixture of toxic components including high concern pollutants that alone or as mixtures contribute to disease.

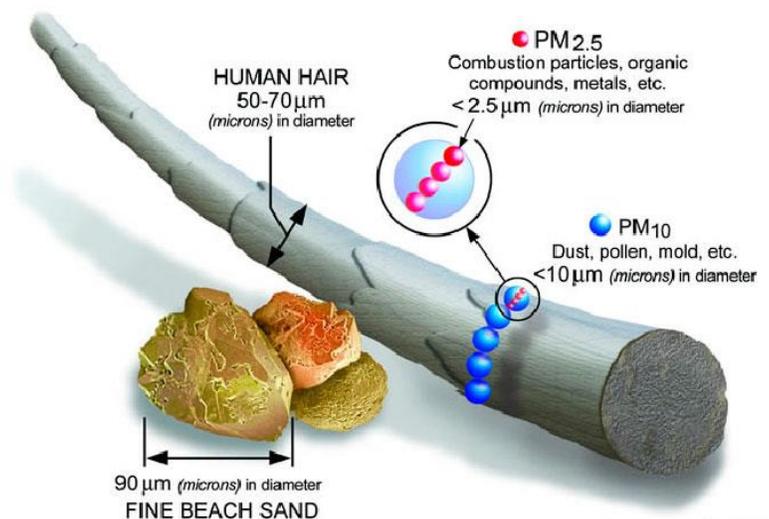


Image courtesy of the U.S. EPA

Fine particles can be smaller than 1/20th the width of a single human hair.

Fine Particles

Dust, soot, and smoke – all contain tiny specks of pollution called fine particles. The most hazardous particles are less than 2.5 micrometers in diameter and travel deep inside the lungs producing a pro-inflammatory response locally and systemically.



Nitrogen Dioxide

Nitrogen dioxide is a reactive gas that can irritate the lungs and lower resistance to respiratory infections. In the Puget Sound region, cars and trucks are the main source of nitrogen dioxide.

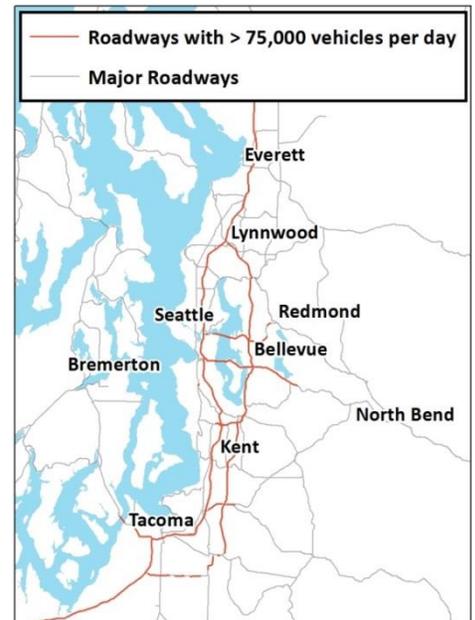
Air Toxics

“Air toxics” are a group of over 400 air pollutants known or suspected to cause chronic health problems including cancer, birth defects, lung damage, immune system damage, and nerve damage. Cars and trucks produce many different types of air toxics, including benzene and formaldehyde.

What’s a safe distance from traffic pollution?

Air pollution levels are highest closer to major roadways. Most pollution levels have improved by about 200 yards away from the road, but some don’t improve until 500 yards away. Studies show poor health outcomes as far as 500 yards away.

Approximately 240,000 people in Puget Sound live within 200 yards of a roadway carrying over 75,000 vehicles per day, and up to 480,000 people within 500 yards.



How do we compare to the rest of the country?

Our air pollution levels near busy roads are similar to other large U.S. cities. Although not near major roads, certain neighborhoods near the Ports of Seattle and Tacoma are also at higher risk due to nearby truck and rail traffic from freight movement.

For pregnant patients:

Tell expectant mothers that living or working near busy roads with exposure to traffic pollution during pregnancy can have an impact on their infant’s birth, development, and susceptibility to respiratory diseases.

For patients with asthma, COPD, other lung or cardiac disease, and older adults:

Ask patients if air pollution is a recognized trigger for them. If they don’t know, recommend a daily symptom diary and compare to local air quality data. If air pollution is a trigger for them or they are at particularly high risk, direct them to check their air quality at www.pscleanair.org before any strenuous activity.

For all patients:

For patients living in higher exposure areas, use the recommendations above to offer ways to avoid air pollution while continuing to stay active and healthy.

You or your patients may contact your local clean air agency. Find our contact information at www.pscleanair.org or call 1-800-552-3565.

How to reduce air pollution risk

- Limit time spent near idling cars and trucks
- Review air quality forecasts before outdoor strenuous activities
- Continue to exercise outdoors, especially around midday when pollutant levels are typically lower
- Limit outdoor strenuous activities when air pollution is high
- Recycle the air in your car when on busy roads
- Continue to open windows in your home freely
- Consider purchasing a portable HEPA filtration unit for your home and replace your filters every three months

Disclaimer: Based upon interpretation of the current literature, the Puget Sound Clean Air Agency is providing this guidance for those who wish to take a precautionary approach to personal decisions. This is not meant to substitute for personal medical consultation with your health care provider.

References

(review of particulate matter health effects) US EPA, “Integrated Science Assessment for Particulate Matter (Final Report)”, EPA/600/R-08/139F, Dec 2009.

(review of nitrogen dioxide health effects) US EPA, “Integrated Science Assessment for Oxides of Nitrogen – Health Criteria (First External Review Draft)”, EPA/600/R-13/202, Nov 2013.

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(statement from health professionals on air pollution and cardiovascular disease) Brook et al, “Air Pollution and Cardiovascular Disease: A Statement for Healthcare Professionals from the Expert Panel on Population and Prevention Science of the American Heart Association”, *Circulation*, 2004, 109, 2655-2671.

(review of links between traffic air pollution and cardiac/pulmonary diseases) Brugge et al, “Near-highway pollutants in motor vehicle exhaust: A review of epidemiological evidence of cardiac and pulmonary health risks”, *Env Health*, 2007, 6, 23.

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(metanalysis of pollution gradients to roadways) Karner et al, “Near-Roadway Air Quality: Synthesizing the Findings from Real-World Data”, *Environ Sci Technol*, 2010, 44, 5334–5344.

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