

# Air Pollution & Lifelong Brain Health

April 8, 2025, The Westin Bayshore  
1601 Bayshore Drive, Vancouver V6G 2V4

## BC LUNG FOUNDATION 22nd Annual Air Quality and Health Workshop

This workshop explores the impact of air pollution on brain health, focusing on recent research that links exposure to air pollution with cognitive decline and neurodevelopmental disorders. Experts in neuroscience, environmental science, and public health will present findings on how air pollution can affect brain function, particularly in susceptible populations such as children and the elderly. Attendees will gain insights into the biological mechanisms behind these effects, as well as strategies for prevention and the importance of improving air quality to protect cognitive health and support healthy brain development over time.

TIME	TOPIC	SPEAKER
08:30-08:45	Welcome	Chris Lam, President & CEO, BC Lung Foundation
	Morning Chair: Dr. Chris Carlsen	
08:45-09:30	OPENER: Overview of the Biological Effects of Air Pollution on the Brain	Dr. Eric Smith, University of Calgary
09:30-10:00	Beyond Lead: Does Air Pollution Threaten Child Cognitive Development?	Dr. Catherine Karr, University of Washington
10:00-10:30	BREAK	BREAK
10:30-11:00	Early Life Air Pollution Exposures and Childhood Neurodevelopmental and Behavioral Outcomes	Dr. Rebecca Schmidt, Department of Public Health Sciences and the MIND Institute, University of California Davis School of Medicine
11:00-11:30	The Health and Educational Benefits of a School Bus Replacement Program	Dr. Meredith Pedde, University of Michigan School of Public Health
11:30-12:00	Presentation of Dr. Robert Caton and Dr. David Bates Scholarships	Dr. Conor Reynolds
12:00-13:00	LUNCH	
	After Lunch Chair: Dr. Michael Brauer	
13:00-13:30	Air Pollution and Cognition: The Lens of Controlled Human Exposure	Dr. Chris Carlsen, University of British Columbia
13:30-14:00	Pay Attention: The Cognitive Effects of Short-Term Exposure to Wildfire Smoke	Dr. Stephanie Cleland, Simon Fraser University (Faculty of Health Sciences) and Vancouver Coastal Health Research Institute (Centre for Lung Health)
14:00-14:30	The Relationship of Air pollution with Subclinical Atherosclerosis and Brain Health in the Canadian Alliance for Healthy Hearts and Minds	Dr. Sandi Azab, McMaster University
14:30-15:00	BREAK	
	Final Session Chair: Dr. Sarah Henderson	
15:00-15:30	Fueling Cognitive Decline: The Role of PM <sub>2.5</sub> Emission Sources in Dementia Risk	Dr. Sara Adar, Department of Epidemiology, University of Michigan School of Public Health
15:30-16:00	Purple Haze All in My Brain: Air Pollution and Dementia Epidemiology and Disease Burden	Dr. Michael Brauer, The University of British Columbia / Institute for Health Metrics and Evaluation, University of Washington
16:00-16:30	CLOSER: Overview of Brain Health Importance at the Societal Scale	Parminder Raina, McMaster University
16:30-16:35	Closing Remarks	Dr. Sarah Henderson

## Faculty



**Dr. Eric Smith** is Professor of Neurology, Radiology, and Community Health Sciences at the University of Calgary, and the holder of the endowed Kathy Taylor Chair in Vascular Dementia. He is a member of the Board of the Canadian Conference on Dementia and the Research Executive Committee of the Canadian Consortium on Neurodegeneration in Aging. His research program seeks to understand vascular contributions to Alzheimer's disease and dementia through epidemiological studies and clinical trials.



**Dr. Catherine Karr** is a Professor of Pediatrics as well as Environmental & Occupational Health Sciences at the University of Washington. She is also Adjunct Professor in the Department of Epidemiology. Her research program has a special focus on the adverse consequence of exposure to air pollutants on child health. She coauthored the American Academy of Pediatric Policy Statement on Air Pollution and Child Health and served on the US EPA Clean Air Scientific Advisory Committee for Ozone.



**Dr. Rebecca J. Schmidt** is a tenured professor and molecular epidemiologist in the University of California Davis School of Medicine Department of Public Health Sciences and MIND Institute, affiliated with the Perinatal Origins of Disparities and Environmental Health Sciences Centers. Dr. Schmidt leads specialized cohort studies with large biorepositories and leads pioneering work on how early life environmental exposures interact with genetic susceptibility, molecular mechanisms, and developmental programming to influence the developmental outcomes of children.



**Dr. Meredith Pedde** is an environmental epidemiologist whose research focuses on the health impacts of mobile sources, with a particular focus on understanding the impacts of clean bus upgrades on student health and performance. She is also interested in understanding the role air pollution on neurological disorders and air pollution exposure science. Dr. Pedde earned her PhD in Environmental Epidemiology from the University of Michigan School of Public Health.



**Dr. Chris Carlsen** is a Professor of Medicine, Canada Research Chair in Occupational and Environmental Lung Disease and holds the Astra-Zeneca Chair in Occupational and Environmental Lung Disease at UBC. He is the Head of UBC Respiratory Medicine, Director of the Air Pollution Exposure Laboratory as well as the Legacy for Airway Health. His research focuses on the respiratory and immunological health effects of inhaled environmental and occupational exposures, using diesel exhaust, western red cedar, and phthalates as model inhalants.



**Dr. Stephanie Cleland** is an Assistant Professor and the Legacy for Airway Health Chair in Promotion of Lung Health in the Faculty of Health Sciences at Simon Fraser University and a Research Scientist at the Vancouver Coastal Health Research Institute. She holds a PhD and MSPH in Environmental Sciences and Engineering from UNC-Chapel Hill. Dr. Cleland's research investigates how climate change-related environmental exposures, such as wildfire smoke and extreme heat, adversely impact human health.



**Dr. Sandi Azab** is an assistant professor in Metabolomic Epidemiology and Global Health, Department of Medicine, McMaster, and a registered pharmacist with the Ontario College of Pharmacists. She is an expert in metabolomics and biomarker discovery and leads multidisciplinary research focused on cardiovascular health within multiethnic Canadian and global cohorts. Dr. Azab is a recipient of the CIHR Research Excellence, Diversity, and Independence (REDI) Early Career Transition Award.



**Dr. Sara Adar** is a Professor of Epidemiology and Global Public Health at the University of Michigan. Her research focuses on air pollution, noise, climate, and the effectiveness of interventions. Sara currently leads research on the environment for a global network of studies on aging and co-leads a coordinating center on the exposome. She is also currently a member of the HEI Review Committee, NIH's Cardiovascular and Respiratory Diseases study section, and Deputy Editor for EHP.



**Dr. Michael Brauer** is a Professor in the School of Population and Public Health at The University of British Columbia and a Principal Research Scientist and Affiliate Professor at the Institute for Health Metrics and Evaluation at the University of Washington. His research focuses on linkages between the built environment and human health, with specific interest in the global health impacts of air pollution, the role of the environment in healthy aging, and health impacts of a changing climate.



**Dr. Parminder Raina** is a Professor in the Department of HEI at McMaster University. He is a fellow of the Canadian Academy of Health Sciences and holds the Raymond and Margaret Labarge Chair in Research and Knowledge Application for Optimal Aging. Dr. Raina became a member of the Order of Canada in 2022 for his research in aging. He is the Scientific Director of the McMaster Institute for Research on Aging and the Labarge Centre for Mobility in Aging. He is the Lead PI of the Canadian Longitudinal Study on Aging including the Healthy Brain and Healthy Aging study.

## Scholarships

Presented by Dr. Conor Reynolds

### Dr. David V. Bates Scholarship



**Amy Klepetar** is a Registered Nurse and a third-year doctoral student in the School of Health Sciences at the University of Northern British Columbia (UNBC). Her co-supervisors are Dr. Neil Hanlon (Geography) and Dr. Margot W. Parkes (Health Sciences).

Amy teaches in the Northern Collaborative Baccalaureate in Nursing Program at UNBC and is a member of CANE, the Canadian Association of Nurses for the Environment. She holds a BA in geography from Dartmouth College (New Hampshire, USA), a BSc in nursing from Johns Hopkins University (Maryland, USA), and a MSc in Public Health from the University of Utah.

Amy's PhD work will include a mixed-methods study exploring various human health effects of industrial air pollution in the Kitimat River Valley, where multiple large industrial developments are situated close to human settlements. Beyond her PhD studies and teaching nursing, Amy enjoys volunteering in her community as a nordic ski coach, playing traditional fiddle music, and adventuring in the beautiful mountains and valleys of unceded Tsimshian and Wet'suwet'en territories with her family.

### Dr. Robert B. Caton Scholarships



**Shayna Uhryn** is currently pursuing a Master's degree in the Experimental Medicine program at UBC under the supervision of Dr. Emily Brigham and Dr. Chris Carlsten. Her research interests include respiratory diseases, specifically, the intersection of respiratory health & wellbeing and climate change. The importance of climate change is apparent, particularly in regard to the risks that rising wildfire smoke poses to human health. Thus, her research explores the dose-response relationship between the concentration of woodsmoke and impact on inflammatory biomarkers in the lungs.

Previously, Shayna completed her Bachelor of Science (Honours) Degree in Anatomy and Cell Biology at the University of Saskatchewan where she conducted research in the Asthma Research Lab. Outside of the lab, Shayna is a certified yoga instructor and enjoys being outside - running, hiking, and biking!



**Christopher Hansen-Barkun** is an undergraduate kinesiology student at UBC, Christopher was deeply engaged in his community as a student-athlete. On the field, he won four consecutive Canada West Championships—twice as a player and twice as a coach—along with a silver medal at the U-Sports National Championship. Off the field, he spearheaded the creation of the Thunderbird Inclusivity Committee and the Recovering Athlete Peer-Support Group. His passion for healthcare extends beyond the classroom, where he has published five peer-reviewed research articles. Now pursuing a Master's at UBC, Christopher investigates the effects of air pollution—specifically fine particulate matter—on physical activity performance. His research is the first to examine air pollution's impact on female soccer performance in North America and represents the largest study of its kind globally. The findings aim to inform evidence-based international air-pollution sporting guidelines.

## Organizing Committee

Dr. Sarah Henderson  
Chair, BC Centre for Disease Control

Dr. Michael Brauer  
University of British Columbia

Dr. Ryan Allen  
Simon Fraser University

Dr. Menn Biagtan  
BC Lung Foundation

Thanks to:

