78th AAN ANNUAL MEETING ABSTRACT

Media Contacts:
Renee Tessman, rtessman@aan.com, (612) 928-6137
Michelle Uher, muher@aan.com, (612) 928-6120

EMBARGOED FOR RELEASE UNTIL 4:00 P.M. ET TUESDAY, MARCH 3, 2026

Abstract Title: Acute Increases in Ozone and PM2.5 During the 2023 Canadian Wildfires Associated with Higher Stroke Incidence and Severity in Camden, New Jersey

Press Release Title: Air pollution from wildfires linked to higher rate of stroke

Authors: Lucas Garfinkel[1], Zehra Jaffri[2], Humza Qureshi[1], Kaitlyn Piotrowski[1], Anjela Anand[3], Nicole Debski[1], Mary Penckofer[1], Maria Jovin[1], Zain Abidin[1], Zachary Christman[3], Khalid Hanafy[4], Elizabeth Cerceo[4]
[1]Cooper Medical School of Rowan University, [2]Rowan-Virtua School of Osteopathic Medicine, [3]Rowan University, [4]Cooper University Health Care

Objective: To evaluate the relationship between short-term increases in air pollutants—ozone and fine particulate matter (PM2.5)—and stroke incidence, type, and severity during the 2023 Canadian wildfires in Camden, New Jersey.

Background: Air pollution is a recognized cerebrovascular risk factor, potentially exacerbating oxidative stress, endothelial dysfunction, and systemic inflammation that precipitate ischemic and hemorrhagic events. The 2023 Canadian wildfires resulted in unprecedented declines in air quality across the Northeastern United States. Evaluating the impact of this large-scale air pollution event on cerebrovascular health may provide important insights into the relationship between wildfire smoke exposure and stroke incidence, etiology, and severity.

Design/Methods: We conducted a retrospective study using the Cooper Observational Acute Stroke and Thrombectomy Registry, including all ischemic and hemorrhagic strokes from June–July 2022 and 2023. Daily mean PM2.5 and ozone levels were obtained from EPA air quality monitors in Camden, NJ. Each stroke was linked to pollutant concentrations from the same day and the preceding 1–2 days to account for lag effects. Primary outcome was stroke incidence while secondary outcomes included stroke type, etiology, and severity (length of stay [LOS], NIHSS, and change in mRS). Mann-Whitney U, Kruskal-Wallis, and Spearman correlation tests were applied.

Results: A total of 122 strokes were analyzed (80 below- vs. 42 above-median ozone days; 83 below- vs. 39 above-median PM2.5 days). Higher ozone levels correlated with greater stroke incidence (p=0.016), higher proportion of hemorrhagic strokes (p=0.027), and more large artery atherosclerosis etiologies (p=0.028). Elevated PM2.5 was associated with higher NIHSS at presentation (p=0.035) and longer LOS (p=0.032). No associations were observed for cardioembolic or small vessel etiologies.

Conclusions: Short-term surges in air pollution during the 2023 Canadian wildfires were linked to increased stroke incidence, hemorrhagic risk, and greater neurologic severity. These findings underscore the cerebrovascular hazards of air pollution exposure and the need for public health interventions during wildfire events.