

# Chemicals stored in home garages linked to amyotrophic lateral sclerosis risk

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Over the last decade, researchers at the University of Michigan have continued to find that exposure to environmental toxins—from pesticides used in agriculture to volatile organic compounds in the manufacturing industry—is linked to the development of amyotrophic lateral sclerosis, or ALS.

The buildup of exposure, which researchers call the ALS exposome, is possibly associated with recreational activities such as woodworking and gardening.

Now, a Michigan Medicine study finds that storing chemicals in a garage at home may be associated with an increased risk of ALS.

The results are [published](#) in *Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration*.

"Identifying disease-provoking exposures can inform and motivate interventions to reduce exposure, risk, and, ultimately, the ALS burden," said first author Stephen Goutman, M.D., M.S., director of the Pranger ALS Clinic and associate director of the ALS Center of Excellence at the University of Michigan.

"Exposures in the home setting are an important part of the ALS exposome, as it is one place where behavior modifications could possibly lessen ALS risk."

Storage containing volatile chemicals in garages is extremely common, whether it's in a car or motorcycle, equipment like a chainsaw or solvents, cleaners, paints, and other items.

Investigators assessed exposures in the residential setting from a survey of more than 600 participants, both with and without ALS. Through [statistical analysis](#), they found that the storage of chemicals—including gasoline and gasoline-powered equipment, lawn care products, pesticides, paint, and woodworking supplies—was significantly associated with ALS risk.

All of the reported chemicals linked to disease development were volatile with toxic components. Most participants reported storing

several of the items in their attached garage.

Storing chemicals in a detached garage, however, did not show as strong of an association with risk.

Researchers say the flow of air and airborne pollutants from attached garages to the living space may explain the finding.

"Especially in [colder climates](#), the air in the garage tends to rush into the house when the entry door is opened, and air flows occur more or less continuously through small cracks and openings in walls and floors," said Stuart Batterman, Ph.D., senior author and professor of environmental health science at the U-M School of Public Health.

"Thus, it makes sense that keeping volatile chemicals in an attached garage shows the stronger effect."

The latest building codes, Batterman notes, tackle this problem by specifying measures to reduce or eliminate these air flows.

"We are beginning to see [risk factors](#) across multiple settings that may associate with a greater ALS risk; we also see some relationships across the studies, for example, woodworking and woodworking supplies and gardening and lawn care supplies," Goutman said.

"This begs the question: is it the activities that are associated with ALS risk or the exposures to related products? This requires further research."

In 2016, the research team found that people with ALS had higher concentrations of pesticides in their blood compared to people without the condition.

A subsequent study published in 2019 linked organochlorine pesticides and polychlorinated biphenyls, or PCBs, to worsening survival for ALS.

"With each study, we better understand the types of exposures that increase the risk of developing ALS," said senior author Eva Feldman, M.D., Ph.D., director of the ALS Center of Excellence at U-M and James W. Albers Distinguished University Professor at U-M.

"We now need to build on these discoveries to understand how these exposures increase ALS risk. In parallel, we must continue to advocate to make ALS a reportable disease. Only then will we fully understand the array of exposures that increase disease risk."

**More information:** Stephen A. Goutman et al, Residential exposure associations with ALS risk, survival, and phenotype: a Michigan-based case-control study, *Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration* (2024). [DOI: 10.1080/21678421.2024.2336110](https://doi.org/10.1080/21678421.2024.2336110)

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