

Living near a golf course linked to Parkinson's – Observations and FAQs on study

The *Journal of the American Medical Association* (JAMA Network Open) recently published a study, which raises questions about golf course proximity and Parkinson's Disease risk but does not conclusively answer them. Public health experts and researchers who have reviewed the study have noted that the study's methodological limitations make it difficult to draw conclusions from the data. As noted by the authors of the study, the role of pesticide exposure from golf courses in Parkinson's Disease risk remains unclear. Without the methodological gaps being filled, the hypothesis linking golf-course pesticide exposure to Parkinson's disease remains speculative.

The US EPA rigorously tests (and registers) the pesticides that the golf industry uses to maintain healthy golf course turf. Pesticides registered by the EPA do not, according to the top researchers in their field, create unreasonable adverse effects to human health and the environment when used according to label directions. Golf course superintendents are leading practitioners of integrated pest management, a philosophy that reduces the potential environmental risks of pesticide usage.

We recognize and deeply empathize with everyone affected by Parkinson's disease and share the hope that clearer answers will emerge soon. Our goal is not to dismiss the very real challenges of those living with PD, but to ensure that any public-health response is grounded in rigorous evidence. At the same time, we stand committed to protecting both the environment and human health. Golf course superintendents adhere to best-management practices and strictly follow EPA-approved product labels—standards that reflect decades of careful testing and regulatory review.

We will continue to work collaboratively with researchers, regulators, and the golf course community to support further study and strengthen environmental safeguards wherever needed. Our shared priority remains the well-being of our neighbors, our environment and our communities.

Parkinson's Disease Study FAQ

Q. What is this study?

A. The study [*Proximity to Golf Courses and Risk of Parkinson's Disease*](#) investigated whether living near golf courses is associated with an increased risk of Parkinson's disease. Conducted by Brittany Krzyzanowski, PhD, and colleagues, it analyzed medical records from the Rochester Epidemiology Project, covering residents of 27

counties in Wisconsin and Minnesota between 1991 and 2015. This case-control study compared individuals diagnosed with Parkinson's disease to matched controls, examining their proximity to golf courses. The data analysis was completed between June and August 2024.

Q. What did the study say?

- A.** The study found that the risk of Parkinson's disease was highest for individuals living within 1 to 3 miles of a golf course, with the risk decreasing as distance increased. Specifically, living within one mile of a golf course was associated with a 126% higher risk compared to living more than six miles away. The effect was most pronounced in areas where golf courses were located in vulnerable groundwater regions served by public water systems.

Q. Does the study conclude golf course pesticides cause PD?

- A.** No. The study authors write, "role of pesticide exposure from golf courses in Parkinson's disease (PD) risk remains unclear." The study is observational and cannot establish causality. It shows an association between living near golf courses and higher PD risk but doesn't prove that pesticides or other factors directly cause the disease.

Q. How do independent experts interpret these findings?

- A.** Experts at Parkinson's UK—including Dr. Katherine Fletcher and Dr. David Dexter—call the pesticide hypothesis "reductive." They emphasize that existing evidence on pesticides and PD is mixed and argue that the study's distance-proxy approach—without measuring actual contamination—falls short of proving causation (Cassella, Health, May 14, 2025).

Q. Did the study identify pesticides present in the local air and water?

- A.** The study did not test groundwater or air for pesticide levels, relying instead on proximity and water service data to infer exposure.

Q. Did the study know exactly which water source each participant drank from?

- A.** No. The researchers inferred each subject's water source based solely on their mapped "water service area" (groundwater, surface water, or private-well zones). They did not survey participants on whether they drank tap water, bottled water, or used filters, nor did they test any household, municipal or rural water district supplies. (JAMA Netw Open. 2025; 8[5]).

Q. Is residential distance alone a reliable indicator of airborne pesticide exposure?

A. No. Airborne pesticide dispersion depends on application methods, wind and weather patterns, topography, and vegetation buffers. Simply living within 1–3 miles does not guarantee inhalation exposure without modeling or measuring ambient air levels (Cassella, Health, May 14, 2025).

Q. Did the study control for other local sources of urban air pollution (e.g., traffic, industry)?

A. No. Although the authors adjusted for broad “urban vs. rural” residency, they did not account for neighborhood-level traffic density, industrial facilities, or construction dust—any of which could confound an association between golf-course proximity and PD risk (Cassella, Health, May 14, 2025).

Q. What do real-world studies say about airborne pesticide levels on golf courses?

A. A 2024 field study found that golfers had “limited concern” for inhaling pesticides—even immediately after playing on sprayed 18-hole courses—suggesting that ambient air levels may be low for players, and thus potentially lower still for nearby residents (Cassella, Health, May 14, 2025).

Q. Does using 2013 golf-course maps accurately reflect exposure over the study period (1991–2015)?

A. Uncertain. The study used golf-course boundaries from a single year (2013) to estimate exposure for cases dating back to 1991. Courses may have been added, removed, or had changing pesticide regimes over those decades, so distance-based proxies may misclassify long-term exposure (JAMA Netw Open. 2025; 8[5]).

Q. Does residential mobility affect exposure estimates?

A. Yes. Parkinson’s pathology typically begins 10–15 years before diagnosis, but the study only used home addresses 2–3 years before symptom onset—and included participants who relocated. This could misclassify long-term exposure, since some may have spent the prodromal period outside the golf-course area (Cassella, Health, May 14, 2025).

Q. Did the study account for other known PD risk factors (e.g., genetics, head trauma, occupational exposures)?

A. It did not. The researchers acknowledge they lacked data on occupational history, head injuries, genetic predispositions, and other environmental factors—leaving open the

possibility that unmeasured confounders could explain the elevated PD rates instead of golf-course proximity (JAMA Netw Open. 2025; 8[5]).

Q. Could genetic factors explain the observed associations?

A. Possibly. Parkinson's has a strong genetic component, but the study did not collect any genetic or family-history data. Therefore, it cannot rule out inherited susceptibility as a driver of higher PD rates near golf courses (Cassella, Health, May 14, 2025).

Q. Can you generalize the results beyond this primarily white, midwestern population?

A. It's limited. The study region is demographically homogenous (~88% White) and covers rural/suburban areas of Minnesota and Wisconsin, which may not reflect pesticide practices, water infrastructure, or genetic susceptibility in urban or more diverse populations (JAMA Netw Open. 2025; 8[5]).

Living and Working in Golf Course Communities

Q. Should I move away from a golf course?

A. No one, including the authors of this study, has recommended that anyone avoid or move away from the golf course.

Q. How is being near the course impacting my health?

A. Research has linked playing golf to improvements in health. Regularly playing golf also improves lung function, especially in older adults, and this aids the optimum functioning of the heart. <https://www.webmd.com/fitness-exercise/health-benefits-of-golf>. A 2020 study contributed to the growing body of research showing that golfers are likelier to live longer and healthier lives, by approximately five years, than the general population. <https://www.heart.org/en/news/2020/02/13/want-to-live-longer-get-into-the-swing-of-golfing>

Golf courses sometimes use pesticides. The pesticides used to maintain healthy golf course turf have been thoroughly tested and registered by the U.S. EPA as not creating unreasonable adverse effects to human health and the environment when used according to label directions. To register a pesticide for public use, the EPA must conclude, based on all the required studies, that the pesticide may be used as directed without undue risk to people, pets, wildlife, or the environment.

Q. How are golf courses professionally managed?

- A.** Golf courses are professionally managed by highly trained superintendents, many of whom hold degrees in agronomy, horticulture, or related fields. These professionals are among the most skilled and conscientious users of chemical management tools and are licensed to apply EPA-registered pesticides safely and responsibly. They follow Best Management Practices (BMPs), including integrated pest management, to minimize environmental risks. Although the average golf course spans about 150 acres, only around 6 acres—primarily greens and tees—are intensively managed. This careful approach helps maintain healthy turfgrass while protecting environmental and public health.

Q. Do well-managed golf courses provide substantial ecological and community benefits?

- A.** Yes, well-managed golf courses can provide substantial ecological and community benefits. They create valuable green spaces that support recreation and enhance wildlife and pollinator habitats. Healthy turfgrass on golf courses helps clean the air, cool the atmosphere, and generate oxygen. It also acts as a natural filter, trapping pollutants and helping to manage runoff. Many golf courses even serve as effective sites for disposing of treated wastewater, contributing to local water management and environmental sustainability.