Pesticides and Golfers: a Pilot Study

02/03/2026

Study center	Center for the Brain & Environment, Atria Research and Global Health Institute
Rationale	Previous research links living near golf courses, which often use large quantities of pesticides, with an increased risk of Parkinson's. Few studies have used biological assessments to measure pesticides in the bodies of golfers. Our proposed study aims to do exactly that.
Study period	Longitudinal
Objectives	**1. Golfer vs non-golfer:** To compare the concentrations of selected pesticides in golfers with paired non-golfers **2. Population benchmarks:** To compare the pesticides in regular golfers and paired non-golfers with U.S. Environmental Protection Agency recommendations **3. Pre/post golfing:** To compare the urinary concentrations of pesticide biomarkers from golfers before and after playing a round of golf
Investigators	Ray Dorsey, MD; Brittany Krzyzanowski, PhD; Bruce Lanphear, MD; Jason Richardson, PhD; Khadija Rejto; Edwina von Gal; Julia Lewis; Josephine Dorsey and other colleagues
Study population	Up to 120 individuals
Study design	Longitudinal study using biological samples to measure the levels of pesticides in golfers before and after golfing, as well as paired non-golfing controls
Main entry criteria	**All participants** ● Able to speak and read English ● Willing and able to complete study assessments **Golfers** ● On average complete at least two rounds of golf per week **Non-golfers** ● On average play less than one nine-hole round of golf per month ● Has not played golf in the past 7 days ● As similar as possible to paired golfer in age, sex, residency, profession, pesticide-involving hobbies such as gardening, race/ethnicity, diet (organic vs non-organic), and pet ownership
Outcome measures	Urine, blood and hair evaluations of pesticides, especially those commonly used on golf courses
Analysis	We will compare the levels of pesticides from biological samples of golfers with (1) matched non-golfing controls, (2) EPA recommendations, and (3) samples before and after golfing using Wilcoxon signed-rank test, or Tobit regressions, as appropriate. Additionally, we will explore dose-response relationships comparing the frequency of golfing with biological levels of pesticides.

Schedule of Activities

Describe study, assess interest, and answer questions	Coordinator and participant
Administer screening questionnaire	Coordinator and participant
Consent participant	Coordinator and participant
Complete questionnaires and surveys ● Demographic information ● Golfing history ● Medical history ● Environmental health	Coordinator and participant
Collect clinical samples ● Collect hair sample ● Collect blood sample ● Collect urine sample ● Provide kits for post-golf urine samples	Coordinator, nurse, and participant

References

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