

## Could Antibiotic Use in Midlife Lead to Cognitive Decline?

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Chronic antibiotic use among women during midlife may increase the risk of cognitive decline later in life. This is according to a prospective population-based cohort study involving more than 14,000 nurses published in *PLOS ONE*.

Participants, who were part of the Nurses' Health Study II, took a self-administered neuropsychological test battery between 2014–2018. The researchers found that women who reported significant antibiotic use — at least 2 months of exposure during midlife — had “lower mean cognitive scores seven years later, after adjustment for age and educational attainment of the spouse and parent.” Determining factors included psychomotor speed and attention, learning, and working memory.

Scientists point to antibiotic's negative impact on the human microbiome, particularly as it related to the gut-brain axis:

“Given the profound effect of antibiotic use on the gut microbiome—with prior studies showing alterations in functional potential at 2 and 4 years after antibiotic exposure—the gut-brain axis could be a possible mechanism for linking antibiotics to cognitive function. Indeed, over the last decade, there has been emerging data linking intestinal bacteria to the brain-gut axis. Recent cross-sectional data from small studies indicate large taxonomic differences in gut microbiomes from patients with Alzheimer's Disease when compared to healthy controls. Experimental data demonstrate potential causal mechanisms that might underly these associations.”

### Conclusion

“In summary, we found that chronic antibiotic use during midlife was associated with minor decreases in cognitive scores assessed a mean of 7 years later. These data provide a better understanding of potential complications of antibiotics throughout life, as well as generate hypotheses about the role of the gut microbiome in cognition.”