

# Abstract

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## A randomized trial of beta carotene supplementation and cognitive function in men: the Physicians' Health Study II.

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**BACKGROUND:** Oxidative stress contributes to brain aging. Antioxidant treatment, especially over the long term, might confer cognitive benefits.

**METHODS:** We added cognitive testing to the Physicians' Health Study II (PHSII), a randomized trial of beta carotene and other vitamin supplements for chronic disease prevention. The PHSII is a continuation of the Physicians' Health Study (PHS), which had randomized male participants to low-dose aspirin and beta carotene. Participants include those continuing their original beta carotene assignment from the PHS, begun in 1982, and newer recruits randomized as of 1998. The beta carotene arm (50 mg, alternate days) was terminated; follow-up is ongoing for the remaining arms. Near the close of the beta carotene arm, we interviewed 5956 participants older than 65 years to assess general cognition, verbal memory, and category fluency. The primary end point was a global score averaging all tests (using z scores); the secondary end point was a verbal memory score combining results of 4 tests. We compared mean cognition among those assigned to beta carotene vs placebo. We separately examined new recruits and continuing participants.

**RESULTS:** Among 1904 newly recruited subjects (mean treatment duration, 1 year), cognition was similar across treatment assignments. Among 4052 continuing participants from the PHS (mean treatment duration, 18 years), the mean global score was significantly higher in the beta carotene group than in the placebo group (mean difference in z scores, 0.047 standard units;  $P = .03$ ). On verbal memory, men receiving long-term beta carotene supplementation also performed significantly better than the placebo group (mean difference in z scores, 0.063;  $P = .007$ ).

**CONCLUSION:** We did not find an impact of short-term beta carotene supplementation on cognitive performance, but long-term supplementation may provide cognitive benefits.

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