

# Researchers identify possible explanation for link between exercise, improved prostate cancer outcomes

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Men who walked at a fast pace prior to a prostate cancer diagnosis had more regularly shaped blood vessels in their prostate tumors compared with men who walked slowly, providing a potential explanation for why exercise is linked to improved outcomes for men with prostate cancer, according to results presented here at the AACR-Prostate Cancer Foundation Conference on Advances in Prostate Cancer Research, held Jan. 18-21.

Men who engage in higher levels of physical activity have been reported to have a lower risk of [prostate cancer](#) recurrence and mortality compared with [men](#) who participate in little or no physical activity. The biological mechanisms underlying this association are not known.

"Prior research has shown that men with [prostate tumors](#) containing more regularly shaped [blood vessels](#) have a more favorable prognosis compared with men with prostate tumors containing mostly irregularly shaped blood vessels," said Erin Van Blarigan, Sc.D., assistant professor in the Department of Epidemiology and Biostatistics at the University of California, San Francisco. "In this study, we found that men who reported walking at a brisk pace had more regularly shaped blood vessels in their prostate tumors compared with men who reported walking at a less brisk pace.

"Our findings suggest a possible mechanism by which exercise may

improve outcomes in men with prostate cancer," continued Van Blarigan. "Although data from randomized, controlled trials are needed before we can conclude that exercise causes a change in vessel regularity or clinical outcomes in men with prostate cancer, our study supports the growing evidence of the benefits of exercise, such as brisk walking, for men with prostate cancer."

The Health Professionals Follow-up Study, which was initiated in 1986, enables researchers to examine how nutritional and lifestyle factors affect the incidence of serious illnesses, such as cancer and heart disease. Every two years, participants receive questionnaires that ask about diseases and health-related topics like smoking, physical activity, and medications taken. Questionnaires that ask detailed dietary information are administered every four years.

Van Blarigan and colleagues investigated whether prediagnostic physical activity was associated with prostate tumor blood vessel regularity among 572 men enrolled in the Health Professionals Follow-up Study. Prediagnostic [physical activity](#) was determined through analysis of questionnaire answers. Blood vessel regularity was established by semiautomated image analysis of the tumor samples. Blood vessels that are perfect circles are considered the ideal shape and given a score of 1. Higher values indicate less regular blood vessels.

The researchers found that men with the fastest walking pace (3.3

**More information:** [Abstract: 275791\\_1](#)

Title: Physical activity and tumor vessel morphology among men with prostate cancer; Presenter: Erin Van Blarigan, Sc.D.

Background: Brisk walking and vigorous activity have been associated with lower risk of prostate cancer recurrence and mortality. Exercise has

been reported to normalize tumor vasculature in a murine prostate cancer model, and we previously showed that the extent of small, irregularly shaped vessels in human prostate tumors is associated with increased risk of lethal disease. We hypothesized that brisk walking and vigorous activity would be associated with larger, more regularly shaped vessels in human prostate tumors.

**Methods:** We examined whether pre-diagnostic physical activity was associated with prostate tumor vessel morphology among 572 men in the Health Professionals Follow-up Study who underwent radical prostatectomy or transurethral resection of the prostate. Total, vigorous, and non-vigorous activity and walking pace were assessed via a validated questionnaire administered every two years starting in 1986; participants completed 4.8 questionnaires on average prior to diagnosis. Vessel morphology, including vessel size ( $\mu\text{m}^2$ ), regularity of the vessel lumen ( $\text{perimeter}^2 / 4 \cdot \pi \cdot \text{area}$ ), and microvessel density (number of vessels per high powered field), were ascertained via semi-automated image analysis of tumor sections stained for protein expression of endothelial cell marker CD34. We examined the association between activity (quartiles for non-vigorous and total activity; tertiles for vigorous activity and walking pace) and vessel morphology markers (log-transformed, continuous) using linear regression adjusting for age, body mass index (

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