

Physical activity associated with better cognition in breast cancer patients

August 18 2021, by Julia Evangelou Strait



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A new study from Washington University School of Medicine in St. Louis has found a strong association between high levels of physical activity and the ability to maintain cognitive function among breast

cancer patients treated with chemotherapy. The research lays the groundwork for future clinical trials aimed at investigating whether moderate to vigorous exercise can ward off what is commonly referred to as "chemo brain," a decline in cognitive function many breast cancer patients experience.

The study appears online August 18 in the *Journal of Clinical Oncology*. Collaborators include researchers at the University of Rochester Medical Center in Rochester, N.Y., and the National Cancer Institute of the National Institutes of Health (NIH).

"Cognitive decline related to [cancer treatment](#) is a growing clinical concern," said first author Elizabeth A. Salerno, Ph.D., an assistant professor of surgery in the Division of Public Health Sciences at Washington University. "Some patients with cancer experience memory lapses, difficulty concentrating or trouble finding the right word to finish a sentence. Knowing the detrimental effects of chemotherapy on cognitive function, we wanted to understand the dynamic relationships between physical activity and cognition before, during and after chemotherapy to hopefully inform early, cost-effective prevention strategies to promote health in these patients. Our findings suggest that maintaining higher levels of physical activity may indeed be important for protecting cognition in patients with breast cancer undergoing chemotherapy."

The researchers emphasized that their observational study can't demonstrate that physical activity definitively protects against chemotherapy-related cognitive decline; it's possible that physically active people have other characteristics, independent of exercise, that may protect cognition. But the study sets the stage for clinical trials investigating whether physical activity interventions before and during chemotherapy can indeed ward off treatment-related cognitive decline.

"Physical activity is a complex behavior," Salerno said. "So, it will be important to test whether we can intervene with physical activity during a specific time window, such as during chemotherapy, and protect cognitive function in patients of all activity levels."

The researchers analyzed data from a national sample of 580 [breast cancer patients](#) and 363 cancer-free participants, who acted as controls. The scientists measured physical activity as reported by patients on a questionnaire taken before, immediately after and six months after chemotherapy. At the same three times, the researchers also assessed four different measures of cognitive function.

At the beginning of the study, about 33% of the cancer patients met physical activity guidelines set by the U.S. Department of Health and Human Services. The guidelines recommend at least 150 minutes of moderate to vigorous physical activity per week. During chemotherapy, the percentage of patients meeting the guidelines dropped to 21% and then rebounded to 37% six months after treatment ended. The proportion of cancer-free participants meeting the weekly minimum of 150 minutes of moderate to vigorous physical activity hovered around 40% at all three time points.

"Despite this recovery to pre-chemotherapy physical activity levels, a majority of patients remained insufficiently active," said Salerno. "As we consider the design of future physical activity interventions during chemotherapy, it will be important to understand what may be driving this rebound, whether it be improved health status now that chemotherapy is over or renewed motivation toward healthy aging during survivorship."

The four assessments of cognition included two measures of how individuals perceive their own cognition; a test of visual memory; and a test of sustained attention. Inactive patients showed what is classified as

a moderate reduction in perceived cognitive function, which is considered clinically meaningful. On all of the assessments, patients who had met the physical activity guidelines before and after chemotherapy consistently outperformed patients who had never met the guidelines. The cancer-free study participants performed similarly on all of the assessments, regardless of whether they had met the physical activity guidelines.

Importantly, breast cancer patients who had met the physical activity guidelines before chemotherapy ended up performing similarly to active and inactive healthy participants on the memory and attention tests. While objective measures of memory and attention indicated that physically active cancer patients had performed about as well as cancer-free participants, the physically active patients still perceived a significant decline in cognition, especially during chemotherapy. However, their perceived decline was not as great as that of the inactive patients. The researchers speculate that the self-reported measures of cognition may be capturing other common problems associated with chemotherapy, such as anxiety, fatigue or depression.

"Patients who were consistently meeting physical activity guidelines during chemotherapy not only had better cognitive recovery after chemotherapy completion, they also did not demonstrate clinically meaningful perceived [cognitive decline](#), meaning that they did not report a large perceived cognitive change," said senior author Michelle C. Janelsins, Ph.D., an associate professor at the University of Rochester Medical Center and Wilmot Cancer Institute. "By assessment with our objective cognitive measures, patients who were meeting [physical activity guidelines](#) prior to chemotherapy had better cognitive function scores following [chemotherapy](#) and looked cognitively similar to people who didn't have cancer."

Added Salerno, "These findings contribute to the growing body of

evidence highlighting the importance of promoting [physical activity](#) as early as possible across the continuum of [cancer](#) care."

More information: Salerno EA, et al. Physical activity patterns and relationships with cognitive function in patients with breast cancer before, during, and after chemotherapy in a prospective, nationwide study. *Journal of Clinical Oncology*. Aug. 18, 2021.

Provided by Washington University School of Medicine

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