

How Exercise May Prevent Cardiovascular Disease in Breast Cancer Survivors

CU Cancer Center researcher Zachary Clayton, PhD, is investigating whether high-intensity interval training prior to chemotherapy can prevent premature vascular aging.

December 26, 2025 By Greg Glasgow at the University of Colorado Cancer Center

Effective chemotherapy is curing more [breast cancer](#) patients than ever before, but women who survive breast cancer continue to face an important threat from the treatment: cardiovascular disease.

“Survival rates for breast cancer are outstanding, but unfortunately, once you survive breast cancer, you’re now at a 40% to 50% higher risk of developing cardiovascular disease,” says University of Colorado Cancer Center member [Zachary Clayton](#), PhD, assistant professor of geriatrics in the CU Anschutz School of Medicine. “We are now conducting research to understand how we, as cardiovascular-focused physiologists, can come in during the survivorship period, or maybe even prior to treatment, to try to mitigate the elevated cardiovascular disease burden that these patients experience.”

Examining vascular aging

As part of that research, Clayton, along with fellow CU Cancer Center researcher [Peter Kabos](#), MD, recently [published a review article](#) in the journal Exercise and Sport Sciences Reviews outlining the role that exercise — particularly high-intensity interval training — may play in preventing premature vascular aging caused by breast cancer chemotherapy treatment.

“As humans age, arteries begin to stiffen and blood vessels lose their ability to dilate in response to physiological stimuli,” Clayton says. “I compare it to an old rubber hose left out in the sun for too long — it becomes very rigid and less compliant when you put a volume of fluid through it. Several years ago, we started research to understand how commonly administered chemotherapeutic drugs change the vasculature in the setting of young adulthood and make the blood vessels look similar to those of an older adult.”

Exercise as antidote

Clayton's lab is now conducting research to see how aerobic exercise — the best way to improve the health of blood vessels as they age — can counter the effects of chemotherapy. And given the typical time period between a breast cancer diagnosis and beginning chemotherapy, he and his team hypothesize that high-intensity interval training — a workout style that alternates between short, intense bursts of exercise and periods of rest and recovery and can often show results in a short period of time — may be the best strategy to prime the body to tolerate the treatment.

"The average time delay between cancer diagnosis and onset of chemotherapy treatment is approximately three weeks," he says. "We think that's a very viable therapeutic window where we can intervene. The inability to exercise throughout cancer treatment is usually a result of the chemotherapy making the patient feel very weak, but if they haven't yet started the chemotherapy, that could be a time window where we could imprint favorably on the cardiovascular system prior to them starting chemotherapy."

Next steps

Gleaned from work with animal models, preliminary data from Clayton's laboratory suggest that undergoing high-intensity interval training prior to administering chemotherapy may be beneficial for preventing premature vascular aging. He is also investigating whether undergoing exercise training during chemo treatment has a similar effect.

"The other way we are thinking about exercise training is if we can understand how exercise is working at a mechanistic level, coupled with the appreciation that not everyone is going to engage in exercise training, we might be able to use that mechanistic understanding as therapeutic targets for drugs," he says. "If we know exercise enhances the bioavailability of nitric oxide for example, you could, in theory, give a compound that enhances nitric oxide bioavailability, so you forgo the exercise training and just target that mechanism pharmaceutically."

Whichever exercise method his data shows is most effective, Clayton is excited to move his research to a clinical trial, where breast cancer patients undergoing chemotherapy may have a new avenue to prevent cardiovascular damage.

"We, as a scientific community, are constantly coming up with different ways to train people who cannot engage with traditional aerobic exercise, because we know how beneficial exercise is," he says. "The angle we took with this review article was to understand, 'OK, exercise, at a fundamental level, is a good thing, so how do we apply this good thing to this unique setting?'

"If we can show safety, tolerability and physiological efficacy, combined with a mechanistic understanding of how exercise training is beneficial to arteries before, during, or after chemotherapy treatment, we believe that this sets us up very nicely to propose a follow-up clinical trial."

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