

# Pilot study suggests that T cells become more responsive in exercising cancer survivors weeks after chemo ends

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Researchers may soon be able to add yet another item to the list of exercise's well-documented health benefits: A preliminary study suggests that when cancer survivors exercise for several weeks after they finish chemotherapy, their immune systems remodel themselves to become more effective, potentially fending off future incidences of cancer. The finding may help explain why exercise can significantly reduce the chances of secondary cancers in survivors or reduce the chances of cancer altogether in people who have never had the disease.

Laura Bilek, Graham Sharp, and Geoffrey Thiele, all of the University of Nebraska Medical Center, and Daniel Shackelford, Colin Quinn, and Carole Schneider, all of Rocky Mountain Cancer Rehabilitation Institute, analyzed [T cells](#) in the blood of [cancer survivors](#) before and after a 12-week [exercise program](#). They found that a significant portion of these [immune cells](#) converted from a senescent form, which isn't as effective at combating disease, to a naïve form, ready to fight cancer and infections.

Their poster presentation entitled, "Effect of Exercise on T [Cells](#) in Cancer Survivors," will be discussed at The [Integrative Biology](#) of Exercise VI meeting being held October 10-13 at the Westin Westminster Hotel in Westminster, CO.

## Exercise and Immunity

Study leader Laura Bilek explains that previous research had turned up a variety of positive associations between exercise and cancer—notably, that exercise can reduce the risk of getting initial incidences of several different types of cancers, can often improve prognosis in [cancer patients](#), and can reduce the risk of recurrence and secondary cancers survivors of some types of cancers. However, the mechanism behind these phenomena has been unknown.

Since other research has suggested that exercise can remodel the [immune system](#), making it more effective at fighting disease in general, Bilek and her colleagues decided to investigate how exercise affects the immune system of cancer patients. Working with a group of 16 cancer survivors, all but one of who recently finished chemotherapy cancer treatment, the researchers focused on T cells, a type of immune cell that attacks a variety of infectious agents as well as cancer cells. After chemotherapy, previous research had shown that the majority of T cells become senescent, with a decreased ability to fight infections and cancers. However, Bilek says, rebuilding the population of responsive (naïve) T cells is critical for regaining normal immune function and cancer-fighting ability.

The researchers first took blood samples from each of the volunteers to examine how many senescent and naïve T cells each had. Then, these study subjects were all enrolled into 12-week exercise programs at the Rocky Mountain Cancer Rehabilitation Institute. All programs were individualized for the study participants, incorporating elements of cardiovascular exercise, strength and endurance training, and exercises for flexibility, posture, and balance, with extra emphasis in areas where participants were weak.

After the 12-week program, the researchers drew a second blood sample from each volunteer and ran the same T cell analysis.

## Another Reason to Work Out

Results showed that the ratio of senescent to naïve T cells changed favorably in the majority of participants, with most of the study subjects regaining greater numbers of the naïve variety.

"What we're suggesting is that with exercise, you might be getting rid of T cells that aren't helpful and making room for T cells that might be helpful," Bilek says.

She adds that this finding highlights the importance of exercise for all, including those with cancer and cancer survivors. These two populations might benefit especially from the heightened "cancer surveillance"—the ability of the immune system to seek out and destroy budding cancers—that this study suggests exercise brings, Bilek explains.

"There's a litany of positive benefits from exercise," Bilek says. "If [exercise](#) indeed strengthens the immune system and potentially improves [cancer](#) surveillance, it's one more thing we should educate patients about as a reason they should schedule regular activity throughout their day and make it a priority in their lives."

**More information:** [bit.ly/OrMFtN](https://bit.ly/OrMFtN)

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