

# Getting fit to fight cancer

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Credit: Thirdman from Pexels

Survival rates for cancer are improving, but it is still the [leading cause of death](#) by disease for those over one year of age in the European Union (EU). Could exercise hold one of the keys to combatting cancer? And if so, how much physical activity is needed to show real benefits in both children and adults?

Thanks to medical advances, cancer patients young and old can look forward to a better quality of life. However, despite all the progress made, the numbers remain disheartening. This is especially true for children and adolescents. According to the European Society for Pediatric Oncology, [every 15 minutes, a family in Europe gets the shocking news that their child has cancer.](#)

The evidence keeps rolling in. Exercise is one way to address this difficult fact. But [exercise](#) might be one of the last things on the mind of a person who has been diagnosed with cancer.

Can exercise become one of the most important cancer treatments for the young, and empower them to live longer, healthier lives?

Physical inactivity is one of the most common side-effects of cancer treatment in children and adolescents. In adults, this side-effect is dealt with through an adapted [exercise therapy](#) called exercise oncology that is becoming more and more recognized as a treatment option. Focusing on the entire body, it uses a broad range of activities, from breathing, balancing and [aerobic exercises](#) to stretching and strength training.

## **Exercise therapy and digital health technology**

"Exercise intervention studies in adult cancer patients have shown the beneficial effects of physical exercise on their muscular and cardiorespiratory performance during and after medical treatment," said Prof. Dr. Jörg Faber, head of the Childhood Cancer Centre at University Medical Centre Mainz, Germany. "Furthermore, those benefits are associated with a significant improvement in patients' physical and mental health over time, and a reduction in frequent side-effects, including fatigue." Despite its success with adults, exercise oncology has not been tailored to younger patients.

More importantly, there is little evidence on whether exercise oncology can improve the lives of children and adolescents with cancer.

According to Sandra Stössel, exercise scientist and coordinator of the pediatric exercise oncology program at the Childhood Cancer Centre, few scientific studies have been conducted on how it benefits the physical and mental wellbeing of childhood cancer patients.

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One study, carried out at University Medical Center Mainz, indicated that exercise oncology can have positive effects. "Many childhood cancer patients in the EU don't have access to adapted exercise training to achieve a sufficient physical activity level," added physician Marie Neu, coordinator of the Childhood Cancer Centre. "Exercise training has to be adapted to the different physiology and social environments of children."

More research and a bigger sample size are needed for definitive proof. Knowing how much exercise is enough to make a tangible difference is also important.

Prof. Dr. Faber and his two colleagues are coordinating the largest study to date into the effects of exercise on the successful treatment of children with cancer as part of the FORTEe project. They are trying to come up with the right exercise dose—the intensity and frequency that need to be adapted individually. In total, 450 subjects aged four to 21 suffering from any type of cancer will participate in a trial while undergoing intensive cancer treatment.

Project partners Oxford Brookes University and German small- and medium-sized enterprises Nurogames and Pixformance Sports have developed augmented reality (AR) and an exercise app that will be

adapted and used in the trial. AR makes exercise more effective and personalized, while the app selects rehabilitation exercises based on patient age and individual needs. Nine hospitals across Europe (Denmark, France, Germany, Italy, Slovenia, Spain, the UK) will carry out a personalized exercise program with the cancer patients.

Thanks to these digital technologies, home-based, family-centered telemedical care will be integrated into cancer treatment.

"This is an essential step towards implementing personalized exercise oncology as an important, novel supportive therapy for cancer patients, and possibly enhancing the physical and mental health of children, adolescents and young adults in the EU and beyond," observed Prof. Dr. Faber. "Potentially, exercise therapy will be established as a standard of care for these [cancer patients](#) in the future."

In 2020, [over 156,000 people died from colorectal cancer \(CRC\)](#) in the EU. It is the second most common type of cancer. Bente Klarlund Pedersen, professor of integrative medicine at the University of Copenhagen, Denmark, aims to demonstrate that regular exercise can delay or decrease the risk of tumors recurring in CRC patients who develop liver metastases. There is overwhelming data to support this. The problem is that this data is only available from pre-clinical trials. "We have yet to truly translate promising observations into specific clinical settings," stated Prof. Pedersen.

Similar to children with cancer, patients whose cancer has spread from their colon or rectum to the liver are very underrepresented in exercise oncology research.

"Integrating exercise strategies into standard treatment may hold untapped potential in this population for improving disease outcomes, the impact of different symptoms on them and quality of life," explained

Prof. Pedersen, who is also director of the Centre of Inflammation and Metabolism and the TrygFonden Centre for Physical Activity Research at Rigshospitalet, Copenhagen University Hospital.

She will also look into identifying the optimal exercise dose by researching the differences in frequency, duration and intensity of exercise for CRC patients as part of the [POET-mCRC](#) project. Two doses—moderate and high—will be used to examine if additional benefits can be achieved with a higher training dose.

CRC patients will participate in a 6-month training program that involves either 300 or 150 minutes of exercise per week. Changes to their overall physical fitness and immune system will be assessed before and after this training period. The delay in formation of new tumors during this period will also be assessed.

The shortage of concrete evidence is lacking here, as well. "Exercise can help maintain a patient's muscle mass and strength," noted Prof. Pedersen. "We know that exercise decreases the risk of 13 different cancers, including colon and breast cancer, but little research has been performed so far to show if exercise training prevents cancer from returning following the removal of tumors."

## **Cancer concerns us all**

The Commission intends to build a strong [European Health Union](#) where all 27 Member States collaborate to improve prevention, treatment and aftercare for diseases such as cancer. There are several initiatives to make this possible. One is [Europe's Beating Cancer Plan](#), the EU's response to the urgent need for a renewed commitment to cancer prevention, treatment and care. Another is the [Horizon Europe mission to conquer cancer](#).

There is no denying that an active lifestyle may help prevent people from getting cancer. Now we just need more concrete evidence that different forms and levels of exercise not only help patients survive, but also thrive during and after a [cancer](#) diagnosis. Professors Faber and Pedersen, together with their research teams, will be seeing to that in the near future.

**More information:** [FORTEe](#)

[POET-mCRC](#)

[Europe's Beating Cancer Plan](#)

[Mission area: Cancer](#)

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