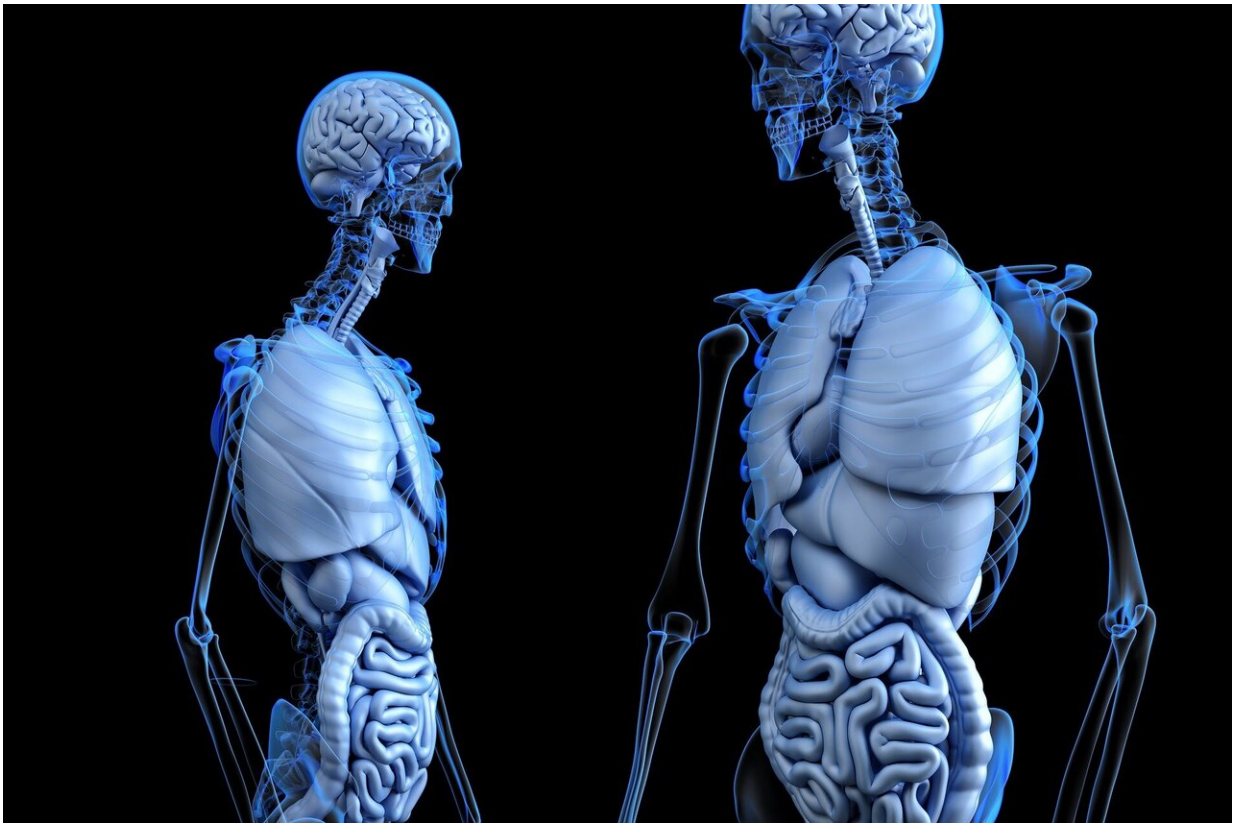


Gentle stroll on treadmill helps prevent liver cancer

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Regular gentle exercise could play a role in reversing liver damage that can lead to cancer, suggests a new study.

Scientists at Newcastle University showed that [aerobic exercise](#) in mice reduced the levels of [inflammation](#) in the liver that develops with ageing, which reversed [liver damage](#) and prevented tumours from developing, with only one mouse in the [exercise group](#) developing a liver tumour.

The research, published in *The Journal of Inflammation*, was funded by Cancer Research UK. Further research could help determine if a regular, gentle routine of exercise may also help reduce the risk of liver [cancer](#) in people.

Cancer development

As we age, our body begins to lose its control over the [immune system](#), which can result in abnormally high levels of inflammation that generally only happens when our body is healing or needs to fight an infection. And when these high levels linger over a long period of time, it can cause tissue damage, which can lead to the development of cancer.

Previous work by the Newcastle University scientists had revealed that mice with long-term, or chronic, inflammation showed signs of accelerated aging. This included thinner skin and less dexterity compared to age-matched mice.

Long-term inflammation also caused shortening of telomeres—protective structures located at the ends of chromosomes—which are associated with increased risk of cancer, with the liver being particularly susceptible to these changes.

Liver cancer incidence rates have increased by three fifths in the UK in the last decade, with 17 new cases every day, and incidence rates are projected to continue increasing. Understanding how to best to prevent some of those cases could have a huge impact for people at risk of the disease.

Professor Derek Mann, from the Newcastle University Centre for Cancer and co-lead author of the study, said: "When you're young, the brakes on your immune system are excellent at preventing it running away, but those brake pads get worn away as you age.

"We wanted to see if exercise in mice, crucially a gentle routine that may mirror exercise achievable for frailer people, could help throw that immune decline into reverse, and could help reduce the risk of liver tumours developing."

Using older mice who had chronic inflammation, the researchers grouped them into an exercise group (16 mice) and sedentary group (13 mice).

Both were monitored in the same way (weighed at the same time and body condition checked), but the exercise group were placed on treadmills for 30 minutes, three times a week.

The scientists showed gentle exercise reduced the levels of inflammation in the liver and improved the metabolism of older mice compared to their sedentary counterparts, even in animals that had advanced liver disease.

Exercise benefits

In addition to reduced risk of liver tumours, the study found additional benefits for mice who were exercised, with less fat in the liver and fewer damaged telomeres.

The researchers also found that the exercised mice were still physically active as they aged, which is an indicator of general wellbeing, while the physical activity of mice who weren't exercised noticeably decreased.

The authors concluded that regular but modest aerobic exercise prevented the decline of general health and promoted wellbeing in these animals, in addition to protecting them against tumours developing in the liver.

Dr. Caroline Wilkinson, co-lead author from Newcastle University, added: "It was remarkable to see just one of these older mice develop a [liver tumour](#) in our exercise group compared with five in the sedentary group, showing it's really never too late to start exercise."

Michelle Mitchell, chief executive of Cancer Research UK, said: "This early research in [mice](#) adds to the evidence looking at the role of physical activity and the risk of cancer.

"We look forward to seeing if further studies show if a gentle to moderate exercise plan could help reduce the risk of [liver](#) cancer in people, especially for older and frailer people who may struggle with more strenuous [exercise](#)."

More information: Arianna Bianchi et al. Moderate Exercise Inhibits Age-Related Inflammation, Liver Steatosis, Senescence, and Tumorigenesis, *The Journal of Immunology* (2021). [DOI: 10.4049/jimmunol.2001022](#)

Provided by Newcastle University

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