

Fitness in childhood linked to healthy lungs in adulthood

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Children who are fitter and whose fitness improves during childhood and adolescence have better lung function as young adults, according to a large study published in the *European Respiratory Journal*.

Good lung function in early adult life is believed to lower the risk of developing chronic lung disease later in life, but until now, there has been very little evidence that childhood fitness had any bearing on adult lung function.

Chronic lung diseases, such as chronic obstructive pulmonary disease (COPD), are a leading cause of global ill health and, with an ageing population, this is projected to get worse. The new study provides early evidence that keeping [children](#) fit could help reduce the burden of lung disease in the future.

The research was led by Professor Bob Hancox, a respiratory specialist at the University of Otago, New Zealand. He explained: "We know very little about the links between physical activity, fitness and [lung growth](#). This is a difficult topic to research because following children over many years is expensive and time consuming.

"This study shows that children who are physically fit go on to have better lung function as young adults. We think that this could reduce the risk of them developing chronic lung diseases as they get older."

The research included a total of 2,406 children, combining a study of

1,037 children in Dunedin, New Zealand, and a second group of 1,369 in Odense, Denmark. These two groups represent the largest published studies that have objectively measured fitness and lung function through childhood, adolescence, and early adulthood.

In the Odense group, aerobic fitness was tested at ages 9, 15, 21 and 29 using an exercise bike to see how much exercise each person could do before they were exhausted. The Dunedin Study used a cycling test at ages 15, 26, 32, and 38 to estimate fitness from the heart rate response to exercise. Lung function tests were done at the same ages in both studies.

The results show that fitter children had better lung function and the more their fitness improved during childhood, the greater their lung capacity when they reached adulthood. The link between lung function and fitness remained after the researchers took account of factors such as height, weight, asthma, and smoking. The results also showed a stronger effect in boys than girls.

Professor Hancox said: "We don't know why fitness and lung function are linked but one explanation could be that fitter people have better respiratory muscle strength as well as other muscle strength."

The two studies are ongoing and researchers hope to collect data on fitness and lung function as the participants get older. This will allow them to see if the effect of childhood fitness on lung function persists, and whether fitness can indeed protect against lung disease.

Professor Hancox said: "We need to keep studying these people to find out whether the association between fitness and lung [function](#) continues into later adulthood. If it does, improving and maintaining fitness could translate into important reductions in [chronic lung disease](#)."

"In the meantime, this provides another reason to make sure our children

get fit and stay fit. Exercise and [fitness](#) are good for our bodies and this appears to be true for our lungs as well as other aspects of health."

Thierry Troosters, President-elect of the European Respiratory Society and Professor of Rehabilitation Sciences at Katholieke Universiteit Leuven, Belgium, said: "This paper provides further support for encouraging active children and adolescents, which is supported by most health authorities and our own Healthy Lungs for Life campaign. Regular exercise, particularly in clean air, is an important factor to maximize lung growth, alongside avoiding second-hand smoke and eating a healthy diet.

"The better your peak [lung function](#) the better you're protected against lung ageing in later life. It seems that regular sports in childhood and adolescence, ensuring development of peak exercise capacity, may be your [lung](#)-insurance for later."

More information: Robert J. Hancox et al, Does physical fitness enhance lung function in children and young adults?, *European Respiratory Journal* (2018). [DOI: 10.1183/13993003.01374-2017](https://doi.org/10.1183/13993003.01374-2017)

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