

# Cystic Fibrosis Research News

**Title:**

Body composition and body mass index measures from 8 to 18 years of age in children with cystic fibrosis

**Lay Title:**

What happens to muscle, fat and body mass index between 8 and 18 years of age in children with cystic fibrosis

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**What was your research question?**

1. Observe how body mass index (BMI), (calculated by weight/height in metres<sup>2</sup>), and body composition measures (a way to look at body weight in its individual parts, including fat and muscle) changes with age and gender in children with CF.
2. Compare the relationship between BMI or body composition with lung function.

**Why is this important?**

Firstly, we don't have much information on what happens with children's fat and muscle weight throughout childhood. Secondly, a child's nutrition status is closely linked to lung function and ultimately survival, therefore accurate definition of what is optimal needs review in line with evolving evidence. Currently, a BMI  $\geq$ 50th percentile is accepted as optimal. However recent studies have suggested that body composition measures may define nutrition status better, because it measures muscle weight, which we know is more important for overall health in the general population than total weight (which also includes fat weight).

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## What did you do?

Children with CF have yearly investigations done, including a DEXA every second year. DEXA is a scan that looks at the health of your bones but it can also provide good information on weight coming from muscle and fat (separately). We collected scans done between 2007-2020 along with lung function and BMI from the same day. We plotted these measures and described how they changed with age and gender. For our second aim, we calculated the strength of the relationship of each of the following: BMI, muscle weight and fat weight with that of lung function.

## What did you find?

We found that the proportion of muscle and fat weight changes with age and gender. At our centre, girls tended to have less fat weight than boys until 14 years, and more muscle weight than boys from 12.5 years. We found as BMI and muscle weight increase, so does lung function. While we thought that muscle weight may have a stronger relationship than BMI with lung function, they were comparable. Surprisingly, both had a weak relationship with lung function, meaning other factors apart from nutrition likely impacted on lung function. There was no relationship between fat weight and lung function.

## What does this mean and reasons for caution?

BMI method is fine for assessing nutrition, although the relationship between nutrition and lung function seems to have changed over time and we may need new cut offs. Our findings are only from one centre so may not be representative of the population at large.

## What's next?

CF centres should be able to record body composition information onto their national registry, this would allow larger, multinational analysis including looking at muscle mass and lung function and also potentially reviewing the current BMI targets.

## Original manuscript citation in PubMed

<https://pubmed.ncbi.nlm.nih.gov/37365079/>