

# Cystic Fibrosis Research News

## Title:

**The association between *Staphylococcus aureus* and subsequent bronchiectasis in children with cystic fibrosis**

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## What was your research question?

We aimed to study the effects of the bacteria *Staphylococcus aureus* on patients with cystic fibrosis (CF). Specifically, we wanted to find out if infections with this bacterium resulted in a more rapid progression of lung disease in young children with CF.

## Why is this important?

In healthy individuals, *Staphylococcus aureus* can be cultured from the nose and skin, but will not be found in the lungs. In children with CF however, *Staphylococcus aureus* is present in the lungs, with a prevalence of 1 in 5 patients. Globally, *Staphylococcus aureus* is treated differently, as it is unclear if the bacteria really causes damage. Our study will clarify the effects that *Staphylococcus aureus* has on the lungs and guide doctors on how aggressively they should treat these infections, in an effort to minimise lung damage as well as medication side effects.

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## What did we do?

In an Australian study children with CF underwent a bronchoscopy every year for the first 4 years of life. During the bronchoscopy some fluid was flushed through the lungs and cultured for *Staphylococcus aureus*. When the children were 5 to 7 years old we performed a CT-scan of the lungs and lung function tests to determine the severity of lung disease. We analysed if children that were infected with *Staphylococcus aureus* before the age of 4 had worse lung disease when they approached 5-7 years.

## What did you find?

In our analyses, we found that children who were infected with *Staphylococcus aureus* for the first time at the age of 3 years, sustained more lung damage, visible on CT-scans and performed more poorly on lung function tests when they reached 5-7 years. We wanted to exclude that *Staphylococcus aureus* is a benign bacterium in children who are exhibiting more severe disease progression. We adjusted for disease severity when comparing participants, of children with and without *Staphylococcus aureus*. To note, the relationships between *Staphylococcus aureus* and more severe lung disease remained the same in those adjusted analyses.

## What does this mean and reasons for caution?

Our results suggest that when a *Staphylococcus aureus* infection is present at 3 years of age, there is a significant association with faster progression of lung disease, regardless of previous disease severity. It implies that doctors should try to prevent and treat *Staphylococcus aureus* lung infections in the young CF population. We found the association only for first time infections at 3 years of age, so it should be considered that this may have just been a chance finding. Secondly, there is a risk that we were not able to fully account for all lung damage that occurred prior to the first *Staphylococcus aureus* infection.

## What's next?

Our study shows that *Staphylococcus aureus* lung infections are common in children with CF, furthermore, these infections are associated with more advanced lung damage. To prove that *Staphylococcus aureus* directly causes lung damage, a placebo-controlled randomised clinical trial should be performed using CT-scans of the lungs as outcome measure.

## Original manuscript citation in PubMed

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