

# Cystic Fibrosis Research News

**Title:**

ANTIMICROBIAL SUSCEPTIBILITY TESTING (AST) AND ASSOCIATED CLINICAL OUTCOMES IN INDIVIDUALS WITH CYSTIC FIBROSIS: A SYSTEMATIC REVIEW

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**What was your research question?**

Can we predict how well people with CF will respond to antibiotic treatment if we know how their bacteria respond to treatment in the laboratory, and does the way we test their bacteria in the laboratory matter when trying to find this out?

**Why is this important?**

In CF, we test how different antibiotics kill bacteria from lung infections in the laboratory to help doctors choose antibiotics for treating each individual. The tests performed are expensive and it takes days to obtain results. There are also different ways to test how antibiotics affects the growth of bacteria in the laboratory; but it is unclear if one test is better than other. Furthermore, there are some reasons why laboratory testing may not be as helpful for doctors treating complex CF lung infections compared for treating other bacterial



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infections. If laboratory testing of antibiotics does not provide helpful information about CF lung infections, it may be a waste of money and time, and may cause doctors to choose antibiotics they wouldn't normally choose, which may not always be good for the individual with CF.

## **What did you do?**

We carefully looked at medical and scientific publications to find all studies that showed how people with CF responded to antibiotic treatments and how bacteria taken from their infections had responded to those antibiotics in the laboratory. Then we looked to see how often results seen in the laboratory agreed with what happened when people with CF were treated. We collected these results from all the studies that we could find and compared them with each other.

## **What did you find?**

We found 20 studies in which there was enough information to see how laboratory test results compared with how individuals responded to antibiotic treatment. Most, but not all, of these studies were about *Pseudomonas aeruginosa*. Of these 20 studies, only three suggested that laboratory test results might have agreed with how individuals responded to antibiotic treatment, but the agreement was not very good. In the other 17 studies, there were no relationships between laboratory test results and how individuals responded to antibiotic treatment.

## **What does this mean and reasons for caution?**

Our results show that the way we test bacteria from CF lung infections in the laboratory today may not help us choose the best antibiotics for treating people with CF. There may be times when results from laboratory testing lead doctors to choose antibiotics for treatment which may have worse side-effects for the person being treated or are more expensive. Since laboratory tests are expensive and take time to complete, perhaps they should not be relied upon so heavily to choose antibiotic treatments. We need to be careful in drawing these conclusions, because so few studies with this information have been published.

## **What's next?**

We need more information on how laboratory testing of bacteria relates to individual response to antibiotic treatment. It is unlikely that studies will be run to answer this question, but there is lots of information in the medical charts of those treated at CF Centers that can be studied.

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