

# New test could detect early hearing loss in cystic fibrosis patients

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Experts in Nottingham are investigating whether a new type of hearing test could successfully detect early hearing loss in people with cystic fibrosis (CF).

Hearing loss is a side effect of some of the intravenous antibiotics used to treat the recurring chest infections associated with the genetic condition. Research is now aiming to discover whether this [new test](#) could pick up early hearing loss and allow doctors to reconsider future antibiotic prescriptions.

The study is a collaboration between academics at The University of Nottingham and Nottingham University Hospitals NHS Trust and clinicians and specialists at the National Institute for Health Research Nottingham Hearing Biomedical Research Unit.

## **Early warning system**

Dr Sally Palser, in the University's School of Medicine, is leading the project. She said: "People with CF already face many challenges in managing their health to lead as full and active a life as possible. Adding hearing loss as a result of their treatment is an additional burden which they shouldn't have to bear.

"We are keen to find out whether this new test could act as an early warning system, enabling us to detect hearing loss in patients before they themselves have even noticed its effect. Their doctor may then be able to switch to a different medication in future to prevent any further damage from being done."

CF is a condition in which the lungs and digestive system become clogged with thick sticky mucus. There is no current cure and patients manage their condition with an intensive programme of medications and physiotherapy to help keep the mucus clear from their lungs.

However, CF patients are susceptible to recurring chest infections which sometimes require treatment with intravenous (IV) antibiotics. One commonly used group of drugs called aminoglycosides is linked to hearing loss in CF patients.

Current tests for hearing loss for CF patients need a separate specialist appointment and may not always detect problems at the earliest stage.

## **Detecting hearing loss at an early stage**

Working with specialists at the NIHR Nottingham Hearing BRU, the researchers have developed a new test called the High Frequency Digit Triple Test (HFDT) which is easy to perform and can be done during the

patient's normal CF clinic appointment.

The experts are now recruiting CF patients to the study, which will look at whether the new test is able to detect hearing loss at an early stage, whether it is suitable to be taken by patients who are feeling unwell and about to start on a course of IV antibiotics, and whether there are any underlying genetic reasons why some people are more likely to have hearing damage when treated with antibiotics.

The new hearing test involves wearing headphones and listening to a set of three digit numbers, with varying degrees of background noise. The participant is then asked to enter these numbers on to a keypad in front of them. The new test is easier to perform than the standard tests as it does not require specialist training and equipment. It is also specially designed to pick up the changes in higher frequency hearing initially caused by these antibiotics.

The research team is looking for 300 patients to take part from CF clinics across the Nottingham hospitals, as well as two partner hospitals in the West Midlands: Heartlands Hospital and Birmingham Children's Hospital.

## **Making a difference**

The recruits will be sorted into a number of separate groups for different parts of the study:

- Children aged 11 and over and adults attending a routine CF appointment who will stay for about an hour longer to undergo the new hearing test alongside the standard tests.
- Children aged 11 and over and adults who are unwell and will undergo the new and standard hearing tests before they start IV antibiotics and again after they have finished their medication at

their follow up appointment.

- Children aged between five and 10 years old who will undergo the new test to allow researchers to find out whether it is also suitable for younger patients. A control group of children of the same age will be recruited from local schools to ensure that having CF does not affect their ability to undergo the hearing test.

All patients taking part in the test will also be invited to take part in the genetic testing element of the study which will involve providing a spit or blood sample.

Dr Maria Koufali, Deputy Director of Research and Innovation at Nottingham University Hospitals NHS Trust, said: "This is a great example of clinicians and scientists in Nottingham working closely together to produce a simple but innovative diagnostic [test](#) which could make a difference to lives of children and adults with CF in Nottingham and elsewhere.

"The research could also allow us to understand why some [patients](#) are more susceptible than others to [hearing loss](#), and help us to prevent other forms of deafness."

Provided by University of Nottingham

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