



# Cystic Fibrosis Research News

## Title:

COMPLICATIONS OF LONG AND INTERMEDIATE TERM VENOUS CATHETERS IN CYSTIC FIBROSIS PATIENTS: A MULTICENTER, LONGITUDINAL COHORT STUDY

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## What was your research question?

Central venous catheters (typically placed temporarily in the arm or placed more permanently under the skin) are commonly used to treat flares of cystic fibrosis (CF) lung disease. However, complications from these catheters, such as infection or clotting, can sometimes occur. The type and size of catheters vary greatly, depending on physician and patient preferences, but there is little information to guide appropriate selection. Our study looked at factors that increase the likelihood of complications in both children and adults with CF.

## Why is this important?

Complications of central venous catheters may increase the difficulty of completing treatment of flares of CF lung disease. Complications can also lead to discomfort, arm or facial swelling and trouble finding good veins for placement of future catheters. A major goal of this study was to identify patient characteristics that link to more frequent catheter

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complications. A second goal was to describe features of central venous catheters (for example, catheter size) associated with more complications. The primary purpose of this research is to help treatment teams and patients find new ways to prevent catheter complications.

## What did you do?

We evaluated complications of patients receiving intravenous antibiotics at three CF centers between 2003 and 2011. Data were collected from children and adults treated using both local medical records and information from the CF Foundation Patient Registry (CFFPR). A variety of statistical techniques were used to identify patient- and catheter-specific complication risk factors. Mathematical models were used to assign a “weight” to each risk factor (that is, the strength of the link between risk factor and complication rate) and to compare complication rates among CF centers.

## What did you find?

We found that the following patient factors increased the risk of complications:

- malnutrition
- decreased lung function
- patient history of prior central venous catheter complication
- infection with *Burkholderia cepacia* spp
- having had at least five central venous catheters placed previously

In terms of catheter-related factors, the following increased the complication risk:

- double lumen catheters
- larger diameter catheters

Use of blood thinning medication did not appear to be effective for preventing clotting complications, but the study was not specifically designed to answer this question. Further studies are needed to address the issue.

Interestingly, differences in complication rates were seen among the CF centers, independent of the risk factors we identified, suggesting that there are other yet unidentified aspects of catheter placement and care that are linked to the rate.

## What does this mean and reasons for caution?

An important finding is that larger diameter, multi-lumen catheters were associated with



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more complications. While placement of larger catheters may be convenient for care teams and patients, this should be weighed against an increased likelihood of problems. Also, patients with a history of 5 or more central venous catheters were at increased risk of complications. Although this was a multicenter study, the risk factors that contribute to complications should be confirmed prospectively (that is, going forward) before making formal recommendations.

## What's next?

Collecting catheter placement and usage data nationally within the CFFPR going forward may help us establish and continually improve the standards of care for central venous catheters.

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