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# Understanding Lung Function Tests in Babies and Young Children

Lung (pulmonary) function tests are breathing tests. They are done to see how well your child's lungs are working. They're also used to see how well the lungs are growing and working in premature babies. They help your child's healthcare provider diagnose lung problems. These include bronchopulmonary dysplasia (BPD), asthma, and cystic fibrosis. They are also used to see how well treatments are working for an already diagnosed problem.

Most kids under 5 years old can't do complex lung function tests. Diagnosis is mostly based on symptoms, physical exams, and family history. In some cases, the provider may have your child try low-dose inhaled corticosteroids for a few months. This is to see if they help ease your child's symptoms. If your child's symptoms return or get worse after the corticosteroid treatment is stopped, your child's lungs may not be working correctly. In this case, more testing may be needed.

Symptoms that may mean lung problems, such as allergic diseases or asthma in babies and young children, may include:

- Having a non-productive cough that comes back or does not go away, which may be worse at night
- Having wheezing that comes and goes, trouble breathing, or shortness of breath
- Being less active
- Tiring easily

## Common types of pulmonary function tests (PFTs)

- **Fractional exhaled nitric oxide (FeNo).** FeNo measures nitric oxide in your child's breath. Nitric oxide means that your child has swelling (inflammation) in the lungs. For this test, your child blows into a handheld device. The air in your child's breath is then assessed.
- **Spirometry.** Most children can use spirometry to check lung function by age 6. Some preschoolers can do the test at a younger age. The test involves blowing into a mouthpiece. But by 4 to 5 years of age, children can do spirometry with the help of a provider. Babies and children who are 3 years and younger are unable to follow the instructions for spirometry. In this case, special equipment is used. This includes an inflatable jacket and a clear face mask. These are connected to a machine that records the child's breathing. The child will usually be asleep during the test. The test is painless.
- **Lung volume measurement.** Lung volume tests measure the total amount of air your child's lungs can hold. This test involves breathing through a plastic tube. It can be done sitting in an enclosed space that can measure pressure differences when taking a big breath. Or it can be done by breathing a mixture of air and a very small, and safe, amount of helium. Then, the concentration of helium is measured at various points in the process.
- **Diffusion capacity measurement.** The diffusion capacity of the lungs refers to how easily oxygen can enter the body during regular breathing. The test is done by having

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your child breathe into a tube with a very small, safe, amount of carbon monoxide added.

## **Preparing for a PFT**

In children 5 years and younger, the healthcare provider can change the way the PFTs are done. PFTs are done by a person with experience working with young children. Your child's healthcare provider or staff will tell you how to prepare for your child's test. It's important to:

- Follow any directions your child's healthcare provider has given for not eating or drinking before or after the test
- Discuss with your child's healthcare provider any medicines your child takes. You may need to stop the medicines for the test.
- Talk with your child's healthcare provider about risks and side effects of the test.

Your child's height will be measured. This is because lung size is related to height. Your child's test results can be compared with the results of other children of the same sex, age, and height.