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Sweat Test For Cystic Fibrosis

What is Cystic Fibrosis?

Cystic Fibrosis (CF) is a genetic disorder (passed from parents to child) that affects many functions of the body including digestion, breathing and reproduction. It can affect both males and females. This lifelong illness usually becomes worse with age.

The symptoms and severity of CF differ from person to person. In some patients only lung function is affected while others have both lung and digestive problems. The common symptoms of CF include excessive mucus production, chronic coughing, recurrent pneumonia, wheezing, sinus infections, nasal polyps (bumps inside the nose), poor growth, frequent foul smelling stools, enlarged fingertips and salty tasting skin. CF does not affect intelligence.

In CF the glands that produce mucus, saliva and intestinal fluids do not work properly. These glands produce secretions that are thick and sticky rather than thin and watery. Thick mucus in the lungs interferes with the removal of dust and germs and can cause breathing problems, infections and lung damage. In the stomach, this thick mucus stops food being digested properly which slows growth and development.

Treatment is improving the length and quality of life of people with CF. Antibiotics and physiotherapy can reduce the effects of thick mucus in the lungs. Enzymes and special diets can improve their nutrition. The sooner this condition is diagnosed the sooner treatment can begin.

Please see your own doctor for more information or further explanation about this condition.

How is a Sweat Test Done?

Patients with Cystic Fibrosis produce extremely salty sweat. Based on this observation, the sweat test was developed in the 1950s to diagnose CF, this test is still the standard for diagnosis.

The sweat test consists of three sequential procedures:
(1) Sweat stimulation

Known as pilocarpine iontophoresis. It is the universally accepted by medical authorities as a safe and effective method of stimulating sweat glands. A sweat-inducing drug, pilocarpine, is delivered from the surface of the skin through the watery pathways of the sweat ducts into the sweat glands by a small electric current that is made to flow through the dermal layers. The electric current is supplied by a

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battery-powered device through a pair of electrodes fitted to the limb of the patient. Two electrodes are covered with pilocarpine gel and strapped to the patients forearm. A small electrical current is passed through the electrodes for 5 minutes. This can produce a mild tingling feeling but no pain.

(2) Sweat collection

The electrodes are then removed and a sweat collector (which is about the size and shape of a wrist-watch) is strapped to the same spot. The sweat collector must stay on the arm for 20 to 30 minutes to collect enough sweat to do the test. During this time the patient can move around freely. It is important that the patient has plenty to drink on the day of the test as this will help them to sweat.

(3) Sweat analysis

The collected sweat is then tested in the Laboratory. The results should be with your doctor normally within two working days of collection. Please contact them for the results.

Information for Parents

Sweat testing poses a remote risk of minor skin burns

Information supplied by Elitech, current at 6 January 2020

"There is an element of risk inherent in all medical procedures, no matter how simple. The sweat test has been an important laboratory tool since the 1950's. It provides a quantitative test result to confirm or exclude a clinical diagnosis of Cystic Fibrosis. Unfortunately, the test has been accompanied by occasional minor skin burns. Based on current data and reported events, the apparent burn rate is less than 1 in 50,000. However, experience has shown that when burns do occur, the injuries are minor and there are no lasting effects. The burns usually heal completely within one to two weeks with little or no scarring."

Some types of iontophoretic apparatus are prone to cause burns, particularly if there is procedural error. Fortunately, such burns are extremely rare with the Elitech iontophoretic system. It uses a sophisticated microprocessor current controller and a very low delivery current of only 1.5 milliamperes. Pilocarpine is contained in unique Pilogel drug reservoirs that are 96% water. These features substantially reduce, but do not eliminate, the possibility of skin burns.

Burn descriptions vary from "tiny black pinholes in the skin" to "crater-like, third-degree burns two to three millimeters in diameter." In most of the incidents reported, the children have exhibited no sign of pain or discomfort during iontophoresis, and the burn was not discovered until the electrodes were removed.

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Individuals may exhibit sensitivity to pilocarpine that is typically manifest as mild erythema (redness) of the skin at the electrode locations. In some cases, one or more blister-like welts may also form. These are often mistaken as burns, but they are simply the reaction of the skin to pilocarpine. Such “blisters” invariably disappear within 2 to 3 hours, leaving no after-effects.

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