Pulmonary Function Tests (PFTs), Pulmonary Function Studies, Lung Function Studies/Tests

Your caregiver has scheduled you for pulmonary function testing. Pulmonary Function Tests (PFTs) are tests which help us know how your lungs are working. The lungs are the large organs in your chest on both sides of the heart which allow you to breathe. The main job of the lungs is ventilation. Ventilation is moving air in and out of the lungs. The air breathed in contains oxygen which allows you to live. When you breathe out, your lungs get rid of carbon dioxide, a waste product of breathing. The medical term for breathing in is inhalation. Breathing out is called exhalation. Some medical conditions interfere with breathing. This may be sudden and short lived as with pneumonia, or may be long standing such as with COPD (chronic obstructive pulmonary disease) that which may come as a result of years of smoking.

CONDITIONS THAT INTERFERE WITH NORMAL BREATHING ARE CALLED RESTRICTIVE OR OBSTRUCTIVE

An **obstructive** condition occurs when air has difficulty flowing into the lungs due to resistance. This causes a decreased flow of air in the lungs.
A **restrictive** condition occurs when the chest muscles are unable to expand adequately. This also causes a decreased flow of air in the lungs.

USES OF PULMONARY FUNCTION TESTS

Lung (pulmonary) function studies are used to find out causes of lung problems and what will be the best treatment. The "PFT" terms listed below refer to different procedures that measure lung function in different ways. Pulmonary function testing is quick, simple and safe for most people.

There are many different reasons why PFTs may be ordered.

- For healthy individuals as part of a routine physical examination
- In industrial plants to follow how your lungs are working when exposed to chemicals over a long period of time
- When an illness involving the lungs is suspected.
- PFTs may be used to assess the lung function of patients prior to surgery or other procedures in patients who have current lung and/or heart problems.
- The test is also used for people who are smokers or who have other conditions that might be affected by surgery or other procedures.

Some common measurements or *values* (terms) you may hear your caregiver use are:

- Tidal volume (VT) - amount of air breathed in or out during normal breathing.
- Minute volume (MV) - total amount of air breathed in and out per minute.
- Vital capacity (VC) - total volume of air that can be breathed out after the largest breath in you can take.
- Functional residual capacity (FRC) - amount of air remaining in lungs after normal breathing out.
- Total lung capacity - total amount of air in the lungs with the largest breath you can take.
- Forced vital capacity (FVC) - the amount of air forced out quickly after taking the largest possible breath.
- Forced expiratory volume (FEV) - volume of air breathed out during the first, second, and third seconds of the FVC test.
- Forced expiratory flow (FEF) - average rate of flow during the middle half of the FVC test.
- Peak expiratory flow rate (PEFR) - maximum amount of air during forced breathing out.

The values of these tests vary from person to person. Your values are compared to other people who have had the test and are similar to you in age, size, etc. They can also be compared to previous tests following treatment of lung disease. The tests can determine if lung function is getting better and if the treatments used are successful.

COMPLICATIONS OF TESTING MAY INCLUDE:

- Light-headedness due to over breathing (hyperventilation).
- An asthmatic attack from deep breathing.

SOME REASONS FOR NOT DOING THE TEST INCLUDE:

- Recent eye surgery, because of increased pressure inside the eyes during the procedure.
- Recent abdominal or chest surgery, because of inability to take deep breaths.
- Chest pain or heart problems.
- Tuberculosis or respiratory infections, such as pneumonia, a cold, or the flu.

Discuss concerns with your caregiver before your procedure.

PREPARATION FOR TEST

- Avoid eating a large meal before your test.
- Do not smoke before your test.
- Take medications as ordered by your caregiver.
- Wear comfortable clothing which will not interfere with breathing.

If done as an out patient, you should be present one hour prior to your procedure. Check in at the admissions desk for filling out necessary forms if you are not preregistered. There will be consent forms to sign prior to the procedure. If needed, there is a waiting area for your family while you are having your test.

DURING THE TEST

- You will be given a soft nose clip to wear during the procedure so that all of your breaths will go through your mouth, rather than your nose.
- You will be given a *sterile* (germ-free) mouthpiece that will be attached to the spirometer. The spirometer is the machine that measures your breathing.
- You will be instructed to perform various breathing maneuvers. The maneuvers will be done by inhaling (breathing in) and exhaling (breathing out). Depending on what measurements are ordered, you may be asked to repeat the maneuvers several times before the test is completed.
- You may be given a bronchodilator after testing has been performed. A bronchodilator is a medication which makes the small air passages in your lungs larger. These medications usually make it easier to breathe. The tests are then repeated several minutes later after the bronchodilator has taken effect.
- You will be monitored carefully during the procedure for faintness, dizziness, difficulty breathing, or any other problems.

AFTER THE PROCEDURE

- You may resume your usual diet, medications, and activities unless your physician advises you otherwise.
- Your caregiver will go over your test results with you and determine what is causing your lung problems and what treatments may be helpful.

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