



# **APLEY MEDICAL LIMITED**

**7 ARCHIBALD STREET  
VISTABELLA, SAN FERNANDO.  
TRINIDAD AND TOBAGO, W.I.  
TEL: (868) 657-0205 / (868) 726-2674**



## **PULMONARY FUNCTION TESTS**

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

## What are pulmonary function tests?

Pulmonary function tests (PFTs) are noninvasive diagnostic tests that provide measurable feedback about the function of the lungs. By assessing lung volumes, capacities, rates of flow, and gas exchange, PFTs provide information that, when evaluated by your doctor, can help diagnosis certain lung disorders.

A normally-functioning pulmonary system operates on many different levels to ensure adequate balance. One of the primary functions of the pulmonary system is ventilation, the movement of air into and out of the lungs.

Some medical conditions may interfere with ventilation. These conditions may lead to chronic lung disease. Conditions that interfere with normal ventilation are categorized as restrictive or obstructive. An obstructive condition occurs when air has difficulty flowing out of the lungs due to resistance, causing a decreased flow of air. A restrictive condition occurs when the chest muscles are unable to expand adequately, creating a disruption in air flow.

Pulmonary function tests may be indicated to determine the presence, location, cause, and characteristics of the problem, and to guide treatment.

*Pulmonary function tests* is an inclusive term that refers to several different procedures that measure lung function in different ways. Some of the more common values that may be measured during pulmonary function testing include:



## **Some PFTs involve the use of a spirometer.**

The spirometer is an instrument that measures the amount of air breathed in and/or out and how quickly the air is inhaled and expelled from the lungs while breathing through a mouthpiece. The measurements are recorded on a device called a spirograph.

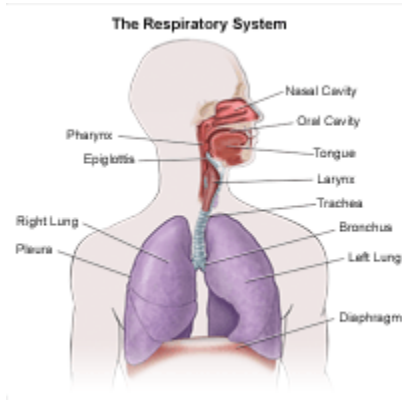
Other test results are derived from calculations based on the results of certain spirometry procedures. In addition to measuring the amount and rate of air inhaled and exhaled, these tests can also indicate how well oxygen and carbon dioxide are being exchanged in the alveoli.

Some PFTs, such as thoracic gas volume or other lung volume measurements, may be determined by plethysmography. During plethysmography, a person sits or stands inside an air-tight box that resembles a short, square telephone booth to perform the tests.

The normal values for PFTs vary from person to person. The amount of air inhaled and exhaled in your test results are compared to the expected average in someone of the same age, height, sex, and race. In addition, results are compared to your previous test results, if previous testing has been done. If you have abnormal PFT measurements or if your results are different from previous tests, you may be referred for other diagnostic tests to establish a medical diagnosis.

# Anatomy of the respiratory system

The respiratory system is made up of the organs involved in the exchange of gases, and consists of the:



[Click image to enlarge](#)

- Nose
- Pharynx
- Larynx
- Trachea
- Bronchi
- Lungs
- The upper respiratory tract includes the:
  - Nose
  - Nasal cavity
  - Ethmoidal air cells
  - Frontal sinuses
  - Maxillary sinus
  - Larynx
  - Trachea

The lower respiratory tract includes the lungs, bronchi, and alveoli.

# What are the functions of the lungs?

The lungs take in oxygen, which cells need to live and carry out their normal functions. The lungs also get rid of carbon dioxide, a waste product of the body's cells.

The lungs are a pair of cone-shaped organs made up of spongy, pinkish-gray tissue. They take up most of the space in the chest, or the thorax (the part of the body between the base of the neck and diaphragm).

The lungs are enveloped in a membrane called the pleura.

The lungs are separated from each other by the mediastinum, an area that contains the following:

- The heart and its large vessels
- Trachea (windpipe)
- Esophagus
- Thymus
- Lymph nodes

The right lung has three sections called lobes. The left lung has two lobes. When you breathe, the air enters the body through the nose or the mouth. It then travels down the throat through the larynx (voice box) and trachea (windpipe) and goes into the lungs through tubes called mainstem bronchi.

One mainstem bronchus leads to the right lung and one to the left lung. In the lungs, the mainstem bronchi divide into smaller bronchi and then into even smaller tubes called bronchioles. Bronchioles end in tiny air sacs called alveoli.

## Reasons for the procedure

There are many different reasons why PFTs may be ordered. They are sometimes ordered in healthy individuals as part of a routine physical. In others, the tests may be ordered when a specific illness is suspected. Some of the disorders that may be detected with PFTs include, but are not limited to, the following:

- **Allergies.** An acquired, abnormal immune response to one or more substances that can cause a broad range of inflammatory reactions.
- **Chronic lung conditions.** Conditions, such as asthma, bronchiectasis, emphysema, and chronic bronchitis, that can be treated but not cured.
- **Asbestosis.** A lung disease caused by the inhalation of asbestos fibers.
- **Chest trauma.** Trauma to the chest, such as fractured ribs or a recent surgical procedure, can restrict an individual's ability to breathe adequately.
- **Restrictive airway conditions.** Impaired lung expansion as a result of conditions, such as scoliosis, pulmonary tumors, or inflammation or scarring of the chest wall.
- **Respiratory infections**
- **Sarcoidosis.** A condition that causes small, fleshy swellings in the tissue around the organs, usually in the liver, lungs, and spleen.
- **Scleroderma.** A disease of the body's connective tissue that causes thickening and hardening of the skin.

PFTs may be used to assess the lung function of patients prior to surgery or other invasive procedures in patients who have current lung and/or heart problems, who are smokers, or who have other conditions that might be affected by surgery or other procedures.

Another use of PFTs is the evaluation of treatment for conditions such as asthma, emphysema, and other chronic lung problems.

There may be other reasons for your doctor to recommend pulmonary function tests.

## **Risks of the procedure**

Because pulmonary function testing is a noninvasive procedure, it is safe for most individuals. It is quick and the individual needs to be able to follow clear, simple directions.

Complications of PFTs may include:

- Faintness or light-headedness due to hyperventilation
- Asthmatic episode precipitated by deep inhalation exercises

Situations in which PFTs may be contraindicated include, but are not limited to, the following:

- Recent eye surgery, because of increased pressure inside the eyes during the procedure
- Recent abdominal or chest surgery, because of potential interference with the ability to take deep breaths and stress on the surgical site
- Chest pain, recent heart attack, or unstable cardiovascular status
- Thoracic, abdominal, or cerebral aneurysm
- Active tuberculosis or acute respiratory infection, such as a cold or the flu



There may be other risks depending on your specific medical condition. Be sure to discuss any concerns with your doctor prior to the procedure.

Certain factors or conditions may interfere with the accuracy of PFTs. These factors may include, but are not limited to, the following:

- Medications such as bronchodilators (open the airways) or pain medications (may affect the ability to perform the tests)
- Pregnancy or gastric distention (may affect the ability to take in deep breaths)
- Fatigue or other conditions that affect the ability to perform the tests

## **Before the procedure**

- Your doctor will explain the procedure to you and offer you the opportunity to ask any questions that you might have about the procedure.
- Generally, no prior preparation, such as fasting, fluid restriction, or sedation is required. However, you may be asked to avoid eating a heavy meal before the test.
- If you are pregnant or suspect that you may be pregnant, you should notify your doctor.
- Notify your doctor of all medications (prescription and over-the-counter) and herbal supplements that you are taking.
- If you are a smoker, you will usually be asked to refrain from smoking for a period of time before the test.
- Your height and weight will be recorded so that your results can be accurately calculated.
- Based on your medical condition, your doctor may request other specific preparation.

## During the procedure

Pulmonary function tests may be done on an outpatient basis or as part of your stay in the hospital. Procedures may vary depending on your condition and your and your doctor's practices.

Generally, PFTs follow this process:

1. You will be asked to loosen tight clothing, jewelry, or other objects that may interfere with the procedure
2. If you wear dentures, you will be asked to wear them during the procedure.
3. You will be asked to empty your bladder before the procedure to optimize comfort.
4. You will sit in a chair or stand for the procedure.
5. 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.
6. You will be given a sterile mouthpiece that will be attached to the spirometer.
7. With your mouth forming a tight seal around the mouthpiece, you will be instructed to perform various breathing maneuvers. The maneuvers will be done by inhaling and exhaling. Depending on what measurements are ordered, you may be asked to repeat the maneuvers several times before the test is completed.
8. You may be given a bronchodilator after certain tests have been performed. These tests will be repeated several minutes later after the bronchodilator has taken effect.
9. You will be monitored carefully during the procedure for faintness, dizziness, difficulty breathing, or any other problems.

## After the procedure

Generally, there is no special type of care following PFTs. You may resume your usual diet, medications, and activities unless your doctor advises you otherwise.

If you have a history of respiratory problems, you may be tired after the procedure. You will be given the opportunity to rest afterwards.

Your doctor may give you additional or alternate instructions after the procedure depending upon your particular situation.

## Online resources

The content provided here is for informational purposes only, and was not designed to diagnose or treat a health problem or disease, or replace the professional medical advice you receive from your doctor. Please consult your health care provider with any questions or concerns you may have regarding your condition.

**APPOINTMENTS AVAILABLE MONDAY – FRIDAY 9:00AM -3:00PM**

**SATURDAYS – SEE FRONT DESK FOR APPOINTMENTS**