



LUNG CANCER CANADA

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Lung Tests and Procedures

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Health care professionals use many diagnostic tests to determine if you have lung cancer, and where it is located. It is unlikely that any one person will have all the tests and procedures listed here, but your doctor will determine which ones are needed in your case, and what specific and individual preparation you must follow.

Below is a brief description of the most common diagnostic tests and what preparation is generally recommended. Remember that your physician may provide individual guidelines more suitable to your own unique situation.

- **Imaging Tests** use x-rays, magnetic fields or radioactive substances to create pictures of the inside of your body. Radiologists are doctors who specialize in medical imaging.
- **Abdominal Ultrasounds** use sound waves instead of radiation to generate snapshots or moving pictures of structures inside the body. After coating the skin with a lubricant to reduce friction, a radiologist or ultrasound technician places an ultrasound transducer, which looks like a microphone, on the skin and may rub it back and forth to get the right view. A computer transforms these images that can be displayed on a monitor. Using an abdominal ultrasound, a doctor can check for cancer. The patient will be asked to not have anything to eat or drink after midnight.
- **CT Scan (Computed Tomography Scan) or CAT Scan (Computered Axial Tomography)** The CT scan is a computer assisted x-ray procedure which is painless, non-invasive, and usually lasts between 5 to 30 minutes. A CT scan is used to view the organs inside the body and can show the location of tumours. The patient may be given a contrast material, either by injection or as a drink to be swallowed. The patient is then positioned on a table, and the table moves slowly through a scanning machine that takes many x-ray pictures of the body in cross-section. Some CT scans require that the patient does not eat or drink beforehand.
- **Magnetic Resonance Imaging (MRI)** uses a powerful magnetic field, radio waves and a computer to produce detailed pictures of organs, soft tissues, bone and most other body structures. It usually last approximately one hour. These detailed images allow physicians to better evaluate areas of interest that may not otherwise be assessed with other methods such as x-ray, ultrasound or CT scans. The patient may be given a contrast material, either by injection or as a drink to be swallowed.
- The patient may be asked to change into a gown during the test, and asked to remove jewelry, accessories, and removable dental work, because any metal will affect the magnetic field within the MRI Unit. Most medical metal implants can be safely scanned, but this should be discussed prior to the test to be sure. After positioning the patient on a moveable table, the technologist will leave the immediate area and speak through a two-way intercom. The moveable table will slide into the centre of a cylinder-shaped tube. It is normal for the area being imaged to feel slightly warm. Because the tube is narrow, patients with claustrophobia or anxiety may want to ask their physician in advance for a mild sedative prescription. The MRI scanner also makes loud thumping and humming noises, so some patients use earplugs. MRI Labs have varying guidelines about eating and drinking prior to the test, depending on the use of the contrast material.
- **Positron Emission Tomography (PET)** imaging is based on the detection of a radioactive substance that is injected into a vein prior to the scan. Different colours and degrees of brightness on a PET image represent different levels of tissue or organ function. A PET scan allows study of body function; it can help detect changes in biochemical processes that may suggest disease before physical changes can be seen by other imaging tests such as CT or MRI procedures. The patient is given an intravenous injection of a radioactive substance, followed by a waiting period of 30 to 90 minutes to allow the substance to move through the body and accumulate in the area under study. During this time, it is important to rest quietly and avoid movement and talking which may alter the substances dispersal within your body. The patient will then be made as comfortable as possible and positioned in the scanner. Some patients are uncomfortable holding one position for the time of the scan, which may be 30 to 45 minutes. Following the test, patients should drink plenty of fluids to help flush the radioactive substance from the body.

- A **Bone Scan** creates images of bones on a computer screen or on film and is a two-part examination. In the first part, a small amount of radioactive contrast material is injected into a blood vessel, from where it travels through the patient's bloodstream. The patient is asked to wait two and half hours while it collects in the bones which then enables detection by the scanner. The second part of the examination is the bone scan itself.
- **Pathology Tests** are tests in which samples of the patient's cells are examined under a microscope to detect whether cancer cells are present. Pathologists are doctors who specialize in laboratory testing of cells to diagnose disease.
- A **Fine Needle Biopsy** is the removal of lung tissue to test for cancer. Using a CT scan or other imaging method, a doctor guides a thin needle between the patient's ribs to a suspected lung tumour or lymph node. A small sample of cells is then removed and sent to a pathologist for examination under a microscope. The patient can expect to be at the hospital for about 5 hours. Patients must have someone accompany them and take them home after the procedure. To prepare for this test, patients must stop taking anticoagulants or any anti-inflammatory drugs (including aspirin) for 5 days beforehand, and to go without eating or drinking after midnight prior to procedure.
- A **Bronchoscopy** is usually done to obtain a sample of deep lung mucus or lung tissue to help diagnose cancer, pneumonia, or other lung disease. A bronchoscope is a lighted, flexible tube with a tiny video camera and biopsy instruments on one end. It is passed through the mouth and directly into the airways of the lungs, where it may take tissue samples (a biopsy) or fluid samples (pulmonary cytology). These samples are then sent for examination by the pathologist in a laboratory. This procedure is generally done using some sedation and a special spray to numb the throat. Patients should not eat or drink past midnight before the procedure. They complete in advance and bring with them an Endoscopy Pre-Assessment form which will have been provided by the attending physician. Patients must also have someone accompany them and take them home after the procedure. The following are tests to check how well the lungs are delivering oxygen to the blood, and air movement in and out of lungs.
- **Arterial Blood Gases:** The purpose of this test is to evaluate how well lungs are delivering oxygen to the blood and eliminating carbon dioxide. This test requires a sample of blood from an artery usually the radial (inner wrist), brachial (inner elbow) or femoral (groin) arteries are used.
- A **Pulmonary Function Test** can tell a Doctor what quantity of air a patient breathes with each breath, how efficiently a patient moves air in and out of his/her lungs and how well oxygen is being delivered to the bloodstream. This test generally requires no preparation.
- **Other Common Tests** are tests which are considered if surgery is recommended. The number and type of tests will vary dependent on the individual patient's condition.
- The purpose of a **Ventilation – Perfusion Scan (V/Q Scan)** is to detect regional function (blood flow and air flow) within the lung. Surgeons use this information to estimate the amount of functioning lung tissue remaining follow a lung cancer resection.
- A **Cardiac Echo**, or echocardiogram, is an ultrasound of the heart. An echocardiogram enables a Doctor to examine the patient's heart valves, determine the size of the heart, and assess how well it is functioning. The test can estimate how forcefully the heart is pumping blood and can spot areas of the heart wall that may have been injured by a previous heart attack or other cause.
- **A Myocardial Perfusion Scan (Persantine/Exercise Thallium Scan)** - This test demonstrates blood flow to the heart muscle at rest, or at both rest and stress, depending on what the patient's doctor has requested. This test is also known as Thallium or Sestamibi scan. Thallium and Sestamibi are radioactive tracers used for heart muscle imaging. A full half day should be allowed for this test. The customary preparation for this test is as follows:
 - Nothing to eat or drink for 4 hours prior to the appointment
 - No caffeine for 24 hours prior
 - No Tylenol 2 & 3 for 24 hours prior
 - Wear comfortable clothing and walking shoes
 - Bring a list of all your medications
 - No beta blockers for 48 hours prior to test, off nitrates for 24 hours

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