

GPIAG Protocols

Spirometry in COPD



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This protocol has been developed specifically to be utilised by primary care nurses delivering respiratory care. It has been produced as a general guide only. It must be stressed that the use of all or part of this protocol must be sanctioned and approved by the appropriate authorised individual from the practice or primary care organisation in which it is to be used. The GPIAG is neither responsible or liable, directly or indirectly for any form of damage or injury caused as a result of information provided in this document.

Aim

To perform spirometry safely and effectively.
"For the diagnosis and assessment of COPD, airflow limitation is best measured by spirometry as this is the most widely available reproducible test of lung function"
GOLD guidelines, 2006

Quality Control

- Only appropriately trained personnel to undertake this procedure.
- Calibrate or verify the machine at the start of each session using a 1 or 3 litre calibration syringe and document reading.

Patient Selection and Safety

Patients should be considered for spirometry as follows:

1. Patients with an unconfirmed diagnosis of COPD
2. Patients over 35 on bronchodilators with a significant smoking history (15 pack years or more) who have one or more of the following respiratory symptoms:
 - Chronic cough present intermittently or every day
 - Chronic sputum production
 - Dyspnoea progressive, persistent, worse on exercise, worse during respiratory infections
 - History of exposure to risk factors i.e. smoking, occupational dusts and chemicals
3. Patients must be clinically stable
4. Contraindications:
 - Haemoptysis of unknown origin
 - Acute disorders affecting test performance such as nausea and vomiting
 - Unstable angina
 - Untreated or uncontrolled hypertension
5. Patients must have no history in the last 3 months of the following:
 - myocardial infarction, CVA or pulmonary embolism
 - eye surgery or abdominal surgery
 - ruptured tympanic membrane
 - lung surgery
 - pneumothorax
6. Patients must be free from infection for 4 - 6 weeks
7. Patients must be given a spirometry patient information leaflet prior to their appointment; this will have information relating to the pre- test procedure (see overleaf)
8. The patient should be given a 40-minute appointment to allow time for a full assessment and reversibility testing if indicated

Undertaking Spirometry

- Calibrate or verify the spirometer regularly, according to the manufacturer's instructions, before each session
- Ensure the patient is relaxed and seated in chair with arms
- Record age, height and weight (for patients who are unable to stand - measure arm span and estimate height).
- Record race using ethnic correction factors

Ethnic correction Factors

Race	Correction Factor
Hong Kong Chinese	100% (as per Caucasian individuals)
Japanese American	11% reduction
Polynesians	10% reduction
North Indians and Pakistanis	10% reduction
South Indians and those of African Descent	13% reduction

- Use single use disposable one way filter mouth piece, consider use of antibacterial filter
- Give patients clear instructions
- Use nose clips during Expiratory Relaxed Vital Capacity test
- Carry out relaxed Vital Capacity (VC) by asking patient to take a full inspiration and then to perform a full expiration in a steady manoeuvre
- 2 tests should be within 5% (Note if patient leans forward place hand on shoulder to discourage as this will compromise the result)
- Carry out three Forced Vital Capacity (FVC) without nose clips by asking the patient to take full inspiration and to exhale fully using forced manoeuvre
 - (2 blows should be within 5% of each other)
 - A maximum of 8 attempts is believed to be acceptable in any one session. If the patient is unable to perform the test, arrange a further appointment
- Consider exemption code for those patients unsuitable for spirometry
- Print out numerical and graphical spirometry results
- Document spirometry results (FEV₁, VC or FVC and FEV₁/VC or FEV₁/FVC ratio) using a template in the clinical system available (an example of this for EMIS can be ordered from the GPIAG at info@gpiag.org)
- Photocopy the spirometry results (if possible scan into computer records as spirometry paper is photosensitive and will fade over time)

- Inform the patient of the results and alter treatment according to symptoms and spirometry findings (see COPD protocol).

Errors in Spirometry Testing

- Poor seal around mouthpiece
- Hesitation or false start
- Early termination on exhalation
- Poor intake of breath
- Poor forced expiratory effort
- Cough during procedure
- Incorrect data into the spirometer prior to testing

Infection Control

- Clean the spirometer according to manufacturer's instructions at the end of each spirometry clinic.
- Document time and date of cleaning and document on record sheet attached to the spirometer.

Maintenance

- Ensure annual service is carried out and document on service documentation sheet attached to spirometer.
- Carry out quality control check on machine weekly using a person with no known chest disease and document the result (this is done by performing a full spirometric manourvre, recording the result and ensuring the difference between the readings is always within a 5% variation).

Pre Test Procedure / Patient Information leaflet LUNG FUNCTION TEST (SPIROMETRY)

Your doctor or nurse has recommended that you have a spirometry test performed.

You have been given a 40 minute appointment. Please bring any inhalers you are currently using to your appointment.

4 - 6 hours before the appointment do not use:

Drug name	Brand name
Salbutamol	Ventolin, Salamol, Aerolin
Ipratropium bromide	Atrovent, Combivent
Terbutaline	Bricanyl

12 hours before the appointment do not use:

Drug name	Brand name
Salmeterol and fluticasone	Seretide
Formoterol and budesonide	Symbicort
Salmeterol	Serevent
Formoterol fumarate	Oxis, Foradil

24 hours before the appointment do not use:

Drug name	Brand name
Theophylline	Uniphyllin, Nuelin
Montelukast, Zafirkulast	Singulair, Accolate
Tiotropium bromide	Spiriva

To improve the accuracy of the test please DO NOT:

- Smoke for 24 hours prior to the test
- Drink any alcohol for 4 hours before the test
- Eat a heavy meal for at least 2 hours prior to the test
- Do any vigorous exercise for 30 minutes prior to the test
- Wear tight clothing which would restrict your breathing

Please ensure you:

- Remove loose fitting dentures
- Remove chewing gum
- Ensure bladder is empty

Please inform the nurse at your appointment if you have had any of the following:

- Recent chest infection requiring antibiotics or steroids
- Heart attack in last 3 months
- Recent eye or other surgery
- Unstable angina
- Perforated ear drum
- Coughing up blood

If you have any questions about this procedure please call:

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Websites: <http://www.gpiag.org>, <http://www.thepcrj.org>

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