

# ARTP Guidelines for Lung Function Testing

## South West Respiratory Network Guidance V.1

### **Authors:**

William McConnell - Consultant Respiratory Physician Dorset County Hospital  
Charles Sharp - Respiratory Consultant Gloucestershire Hospitals NHS Foundation Trust  
Matthew Berry - Consultant in Respiratory Medicine Royal Cornwall Hospital NHS Trust  
Stephen Holmes - Somerset GP and PCRS Education Lead  
Carol Stonham - Senior Nurse Practitioner – Respiratory NHS Gloucestershire CCG



# ARTP Guidelines for Lung Function Testing

## South West Respiratory Network Summary

### **RESTARTING RESPIRATORY DIAGNOSTICS SAFELY AND APPROPRIATELY**

#### **INTRODUCTION AND PURPOSE**

Since the start of the SARS-CoV-2 pandemic, there have been appropriate concerns about the risks of transmitting infection to staff or other patients through respiratory diagnostic tests involving forced or passive expiration, both through the exhalation of breath and the induction of cough, deliberately or otherwise. This led to the complete cessation of services at the height of the pandemic and most services have not yet been able to resume. Recently the Association for Respiratory Technology and Physiology (ARTP) produced guidelines intended to help restart respiratory diagnostic testing safely, in the context of low Covid-19 disease prevalence in the community.

The ARTP guidelines in places require a degree of expert knowledge which is not available to many providers, especially in primary care, requiring for example an ability to measure the number of air changes per hour occurring in any proposed testing area or to have rapid testing for SARS-CoV-2 available. Moreover, it is recognised that while cases are currently low, there remains the potential for cases to have increased in the community before local healthcare professionals are aware of this and so for the proposed approaches to no longer be appropriate. The South West respiratory network has therefore convened a working group including representatives from primary and secondary care settings to produce this document.

This document is not intended to replace the ARTP guidance, nor any local Standard Operating procedure which meets the need to deliver these essential diagnostic tests safely. Rather it aims to provide practical and pragmatic principles to help local services in the South West immediately resume diagnostic testing safely and within their existing capabilities and resources and to continue to do so, until evidence, national guidance, or rates of infection supersede them or otherwise necessitate a change.

#### **PRIMARY CARE**

##### **Indications for Pulmonary Function Testing in Primary Care under current circumstances**

Pulmonary Function testing should only be performed if it will advance management of a patient through diagnosis, where there are no alternative approaches to making a positive diagnosis. Testing should be on a *need* basis, rather than *routine* or *nice to know*. Pulmonary Function Testing is not a substitute for an in depth clinical assessment and should be viewed as an adjunct to this.



Spirometry is not recommended for the investigation of cough. Again, history looking for signs of rhinitis and/or postnasal drip; or reflux and trials of treatment should be considered alongside consideration of evaluating for asthma as per Primary Care Respiratory Society recommendations (see below and linked documents). If these do not yield a diagnosis or bronchiectasis or ILD are considered, a CT scan is recommended.

#### Groups in whom to consider spirometry:

- Breathlessness where there is no suspicion of cardiac problems or interstitial lung disease.
  - o If crackles are heard, spirometry has a low diagnostic yield and CT or NT-pro BNP could be considered
- Suspected COPD
  - o Consider using the [PCRS approach](#) to diagnosis of COPD without spirometry if appropriate
- Intermediate probability of asthma where [diagnosis](#) is uncertain
  - o High probability of asthma should prompt a trial of treatment
  - o Consider use of FeNO if available to aid diagnosis

#### Appropriate Pulmonary Function Tests to consider in Primary Care

Pulmonary Function tests can be low, medium or high risk, as per the [ARTP statement](#) on restarting physiology investigations. High risk investigations, including provocation tests (mannitol, methacholine challenge), Cardio-Pulmonary Exercise Testing, should not be performed in primary care.

Low risk tests can be undertaken in any environment, with fluid repellent surgical mask, visor, apron and gloves. These include Exhaled Nitric Oxide (FeNO) and Carbon Monoxide testing.

Medium risk tests should be performed in an appropriate environment (see guidance elsewhere in this document), with fluid repellent surgical mask, visor, apron and gloves. These include spirometry and bronchodilator reversibility.

Peak Expiratory Flow Recording (PEFR) can be considered remotely (either reported, or via video consultation) in an appropriately competent patient. Performing this “ad hoc”, for example to teach technique could be considered in an outdoor setting in primary care (for example outside the practice) and should not be performed in a clinic room setting unless precautions undertaken like spirometry.

#### Practical delivery of spirometry in primary care

When testing allocate a room and appointment at the end of each day for testing so that the room can lay fallow overnight following testing. Use a room with mechanical air circulation (6 air changes/hour) if available otherwise ventilate as able. The room and equipment will need cleaning on opening the following day. Consider separation of the operator from the patient with an appropriately placed Perspex screen for added protection.



As no high-risk patients will be tested, nor high risk procedures performed in primary care the use of FFP3 masks will not be required. Operators will require IIR mask, gloves, apron and visor.

All tests require **a single use antibacterial antiviral filter** not a one way valved mouthpiece. Equipment requires cleaning as per the manufacturer's instructions between patients.

As this is a period of flux and all areas of primary care vary slightly please check recommendations with your local Infection Protection and Control department.

## **SECONDARY CARE**

In secondary care, there will be a need for greater throughput of patients for lung function assessment and plans to be able to do tests that are higher-risk procedures. Consideration should be given to establishing specific Covid-19 PCR testing pathways to safely increase lung function capacity, making use of such pathways established for other areas which may include surgery or endoscopy. This will depend on local circumstances and available facilities for such pathways.

In areas of high COVID prevalence (approx. >20 cases per week per 100,000 or rising prevalence), lung function testing should be restricted to those patients in urgent need of assessment, such as those being assessed for lung cancer surgery, those being assessed for anti-fibrotic therapy for ILD. Alternative models should be considered to enable continued CPAP and home NIV setup without the risk of aerosol generation, such as using mask fit only, with remote support of patients for first switch-on of their machines in their own homes.

Where prevalence is lower, testing can also be done to guide treatment, especially with the diagnosis of breathlessness and in patients with a deteriorating lung condition, though routine follow up assessment of stable patients should be avoided where this will not alter their management.

### Low risk procedures

FeNO, exhaled CO, transfer factor assessment are non-forced manoeuvres and so are considered low risk for AGP, so patients should be managed as a normal face-to-face consultation, with surgical face mask, gloves, apron and visor. They can be performed in a room with normal ventilation (<6 ACH – Air Changes Per Hour) and no fallow period between patients is needed. Surfaces and equipment should be wiped between patients.

### Medium risk procedures

Spirometry, mouth pressures and lung volume assessments should be conducted in rooms with over 6 air changes per hour as advised by the local estates and infection control services. This would enable one patient to be assessed each hour. Rooms with fewer air changes can be used if left fallow overnight and cleaned the next morning. If over 10 air changes per hour can be achieved, the fallow period between patients can be 30 minutes or less. Such air changes can typically be achieved in operating theatres and negative pressure rooms. Assessment of patients at home, in the open air or in their cars could be considered. Patients should be pre-screened with a symptom assessment. PPE should include an IIR surgical mask, apron, gloves and visor/goggles. Equipment and surfaces should be cleaned between patients after the fallow period.



### High risk procedures

Lung function assessment in patients with chronic productive cough, bronchial challenge tests, cardiopulmonary exercise testing and CPAP trials have greater capacity to generate aerosols. Extra precautions should include patient COVID swab 3 days prior, full PPE (FFP3 mask, gown, gloves, visor, hair covering), use of a room with at least 6 air changes per hour with a fallow period of 1 hour between assessments (or 30 minutes if >10 ACHs). Equipment and floor should be cleaned between patients after the fallow period.

### **Lung function testing in the medium to long term**

This document provides a framework to support reinstatement of pulmonary function testing in the community to aid diagnosis for patients with breathlessness in the South West of England, in the short and medium term whilst COVID-19 remains a prevalent condition. This should be viewed in the context of the NHS Long term Plan, where the provision of reliable spirometry delivered by skilled and well trained staff is key to the investigation of the breathless patient and to the diagnosis of COPD.

A medium to long term strategic aim for STPs across the South West should include the creation of PCN-based diagnostic hubs, where diagnostic spirometry can be delivered, and interpreted at scale by well trained staff in a location that fulfils the necessary infection control principles to protect staff and patients. The patient would undergo spirometry, have a full clinical assessment (history, examination) and review of prior investigations in order to arrive at a diagnosis and management plan.

Primary care networks are encouraged to investigate with urgency the options within their area regarding the location of such a service and the staff with the skills to deliver the service. Options could include rooms in primary care where ventilation can be assured, operating rooms in community hospitals or well ventilated inpatient side rooms in community hospitals. Staff with these skills could include practice nurses with accredited spirometry training and advanced assessment skills, though alternatives could include clinical physiologists, physiotherapists and physician associates.

