

Diagnostic spirometry in primary care SOP – Revised Feb 2023

Introduction

The aim of this document is to provide practical support and guidance for the restart of diagnostic quality assured spirometry across health care systems following a pause during 2020 – 2022 due to Covid-19 restrictions. It was based on a publication produced by colleagues in NHS West Yorkshire ICB.

This guide is a pragmatic approach and will be reviewed regularly and amended once the impact of the pandemic on spirometry testing has further reduced. Whilst the pandemic is not over, spirometry, a crucial diagnostic test in diagnosing respiratory disease is one of the key activities that needs to be restarted.

Without diagnostic spirometry, patients may receive provisional diagnoses with potential consequences including unnecessary or inappropriate treatment or lack of treatment to improve for their condition. It's also an important factor in addressing health inequalities given we know the incidence for those with respiratory disease is higher in disadvantaged and protected groups and areas of social deprivation(1)

For these same reasons the quality of the test also matters. This means that the test is performed to quality standards to produce an accurate reflection of lung function by a trained and competent operator, and the test is reported on to similar quality standards by a trained and competent reporter. This forms the basis of supporting the confirmation of an early and accurate diagnosis of COPD or supports where appropriate a diagnosis of asthma or helps to support exclusion of these conditions.

Feedback from systems and practices suggests many are now moving towards the restoration of spirometry and the following points will be useful as part of these considerations:

1. Spirometry can be performed safely for patients and staff

Recently published evidence confirms that spirometry is not aerosol generating, any risk is with an associated cough and simple mitigating strategies used more generally to manage cough are effective in reducing risk.(2)

Spirometry is not on the UK Aerosol Generating Procedures (list and the most recent rapid review of aerosol generating procedures in June 2022 concluded that it should remain excluded from the list). This means general IPC guidance should apply and this has been recently updated by UKHSA(3), marking a step in the transition back to pre-pandemic IPC measures provided they were adequate.

Infection Prevention and Control Teams have been consulted in the development of this document.

2. Support is available to deliver high quality spirometry

The test, whilst basic, does require a clear understanding of the process and patient compliance to deliver the correct results and so it is important staff receive the appropriate support and training to deliver this with the necessary confidence and competence. The Association of Respiratory Technology and Physiology sets and assesses competence against the standards for quality assured spirometry. All diagnostic spirometry should meet these essential quality standards(4, 5).

Training is provided by a range of providers and a number of options are available, including e learning. It is also possible to split the certification between those performing and those reporting spirometry, allowing some staff, such as healthcare assistants, to focus on undertaking of the measurement.

It is important to acknowledge that while SARS-CoV-2 infection presents a new challenge with respect to Infection Prevention and Control (IPC), other airborne or contact transmitted pathogens considerations (e.g. influenza, tuberculosis, HIV) have long presented similar challenges, both in hospital and community settings. Settings will already have in place IPC procedures to minimize and 'manage overall risk'.

An update of the document 'A Guide to Performing Quality Assured Spirometry'(6) will also be released shortly from the UK Chief Scientific Officers on how to perform quality assured spirometry in primary care and the community. This guide will be added once available.

Preparation for restart / diagnostic hub

- Equipment should have an annual service and calibration performed as per manufacturers guidance, where applicable
- Any software linked to the spirometer should be up to date.
- Manufacturer information regarding cleaning should be obtained and reviewed and undertaken
- Spirometry should be performed with a single use bacterial/viral filter in the circuit that meets ATS/ERS standards
- Bacterial / viral filters may impact readings: Check with spirometer manufacturers whether the machine should be verified with or without a filter in place– some machines have corrections built-in so should be verified without a filter, even if testing with one.
- Patient literature should be reviewed to include additional steps to mitigate against SARS-CoV-2 infection
- It is nationally “recommended” that all staff performing, and interpreting spirometry should be certificated and registered on the ARTP Spirometry Register
- We suggest that any staff undertaking spirometry seek refresher training.

Workforce considerations

- Spirometry staff should attend training updates
- Staff undertaking spirometry should have received additional IPC training as part of their update
- Staff should have competence for performance and reporting reviewed

Spirometry request considerations

- Referring clinician makes decision to refer a patient for spirometry as per guidance set out in the **Prioritisation of Patients- Does my patient need Pathway** (Appendix 1)
- Referring clinician completes Diagnostic Spirometry checklist (Appendix 2) and saves it to the patient record
- Referring clinician discusses the potential risks and benefits with patients to ensure informed decision-making (see Appendix 1 and 3 for supporting guidance)

Performing Diagnostic Spirometry

Step 1. Room preparation

Use a room with ventilation, either an extractor fan or an open window.

- The room used ideally should contain no superfluous items and should be kept clear of all unnecessary equipment
- The verification syringe will need to be pumped through to ensure environmental conditions are equilibrated before verification.
- There needs to be an orange bin and access to or cleaning facilities, i.e. sink

Step 2. Staff PPE/Preparation

- Staff should follow practice Infection Control Procedures (PPE and hand washing)

Step 3. Performing Spirometry

- Call patient into the room for testing.
- Check patient identity, name, date of birth and the first line of address. Measure patient's height and weight and input this into the software.
- Ensure the door is closed.
- If no contraindications:
 - Perform spirometry as per standard approach. **ALL tests require a single use antibacterial and antiviral filter NOT a one-way valved mouthpiece.**
 - Explain the test to the patient with the extractor fan turned on if there is one available.
 - Step back and be behind the patient whilst they perform the test.
 - Complete three acceptable tests. **PATIENT PUTS ON SURGICAL MASK IN BETWEEN EACH TEST** so that if they cough, they are coughing into a mask. Dispose of the filter into the orange clinical waste bin.
 - Encourage patient to perform hand hygiene using alcohol based hand rub, unless contra-indicated
 - Patient leaves the room. Open the window and if applicable extractor fan is turned on.
 - Wipe down the hard surfaces and clean spirometer using detergent wipes: "EN14476 standard" i.e. Clinell wipes
 - Perform hand hygiene

The Result

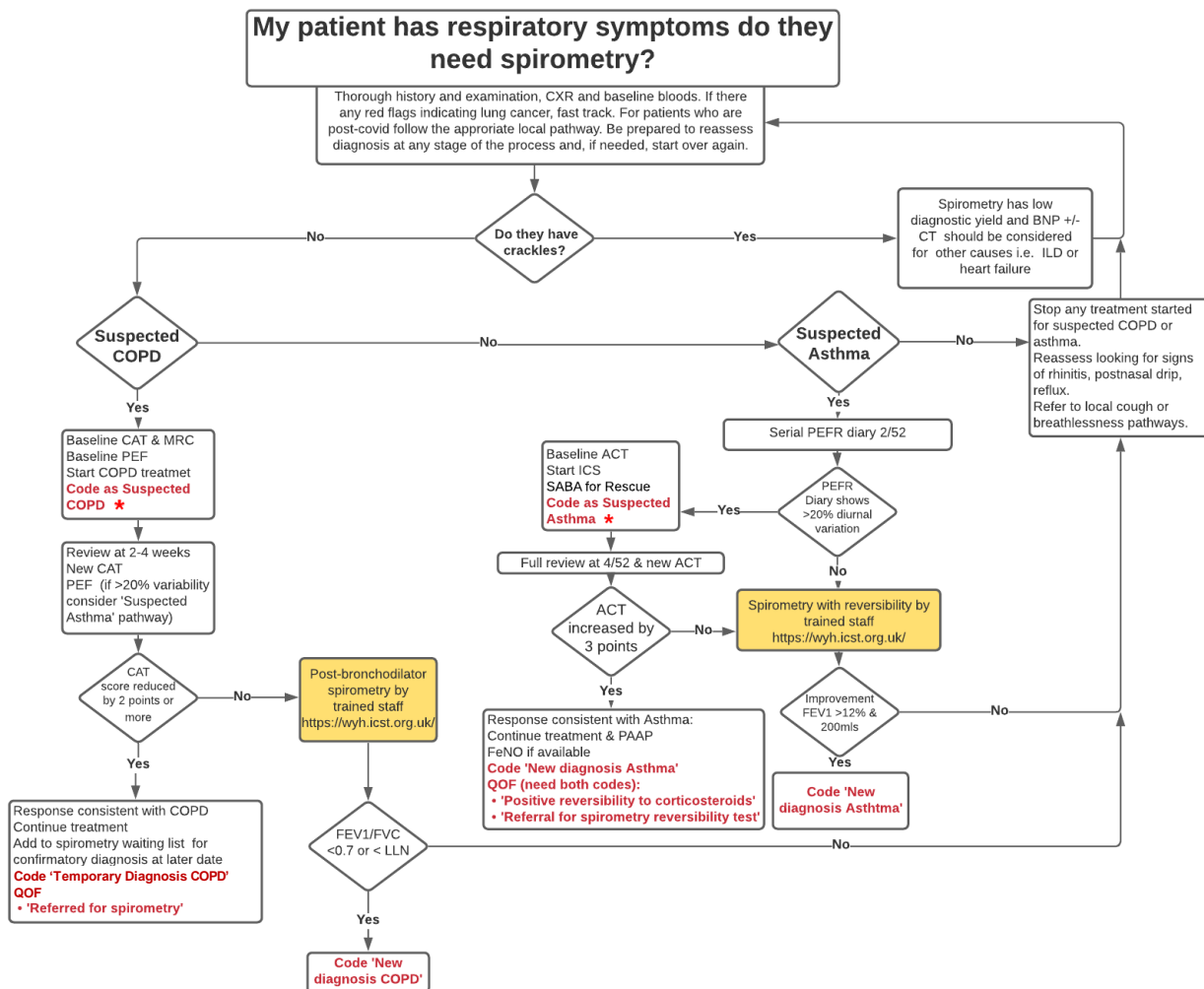
- Spirometry Complete - Advise the patient on agreed follow-up
- Spirometry unsuccessful - Leave patient on the waiting list to be rebooked at a later date.
- Technical report made and results added to patient record
- Requesting clinician notified with spirometry and report to take action with the patient

appendix 1 - Prioritisation of Patients- Does my patient need spirometry

During the pandemic access to spirometry and reversibility testing has been severely restricted and resulted in a large number of patients receiving a temporary diagnosis and awaiting diagnostic spirometry.

The flow chart below is intended to be used to prioritise those patients who require access to treatment if there may be a significant wait for spirometry testing. Consideration needs to be given to FeNO testing if there is any suspicion of asthma (please see FeNO SOP)

Once access to spirometry has been re established and impact of the pandemic reduced, please follow BTS/SIGN for Asthma and NICE for COPD.



* Please follow national guidance whenever possible.

Appendix 2 - Diagnostic Spirometry Checklist

IMPORTANT NOTE

Due to patient effort needed to obtain reliable spirometry this test needs to be done during periods of clinical stability

It is therefore imperative that at the point of referral the patient is clinically fit to undertake a spirometry test and this is reviewed at the time of testing

PATIENT DETAILS

Patient name	
Date of Birth	
NHS Number	
Address	
Telephone no(s)	
Any special requirements	

REFERRER DETAILS

Name	
Designation	
GP Practice	
Telephone no(s)	
Email address	
Date of referral	

CLINICAL HISTORY

Past medical history				
Clinical history including duration of symptoms				
Current medication				
Allergies				
Smoking history	Current	Ex	Never	Pack Years
Inhaled Therapy	Yes	No	Type:	
Antibiotics in last ?? days	Yes	No	Type:	

PRIOR TO REFERRAL

Spirometry is a test which will help confirm clinically suspected asthma or COPD. Therefore, please ensure differential diagnosis is considered, before making this referral, ie other causes of cough; post nasal drip; reflux disease; suspected cancer, other causes of dyspnoea; cardiac disease; obesity; PE or other acute respiratory conditions

PLEASE DISCUSS WITH CLINICIAN IF ANY CONTRAINDICATIONS ABOUT NEXT STEPS

Please check that the following contraindications have been excluded [plus use clinical judgement]:	Please tick <input checked="" type="checkbox"/>
Haemoptysis of unknown origin (forced expiratory manoeuvre may aggravate the underlying condition);	
Pneumothorax [in the last 12 months]	
Unstable cardiovascular status (forced expiratory manoeuvre may worsen angina or cause changes in blood pressure) or 'recent' myocardial infarction or pulmonary embolus;	
Thoracic, abdominal or cerebral aneurysms (danger of rupture due to increased thoracic pressure);	
Recent eye/ear/thoracic or abdominal surgery [in last 3 months]	
Presence of an acute illness or symptom that might interfere with test performance (e.g. nausea, vomiting)	
Recent thoracic or abdominal surgery	
Chest infection or pneumonia [in the past six weeks]	

Pregnancy [third trimester]	
Uncontrolled hypertension	

REASON FOR REFERRAL

Condition Clinically suspected	COPD	Asthma	Other [please advise]
Is this referral to review an existing diagnosis?	Yes / No		
Is this referral to confirm a new diagnosis?	Yes / No		

Appendix 3 - Contraindications for Spirometry(7)

Absolute Contraindications

- Active Lung infection e.g. AFB positive TB until treated for 2 weeks
- Active or suspected SARS-CoV-2 infection identified through PCR or LFD swab in the last 30 days, pre attendance questionnaire, increased temperature or presenting symptoms
- Asked to isolate by NHS app, a Public Health or NHS professional in the previous 10 days
- Conditions that may be cause serious consequences if aggravated by forced expiration e.g. dissecting / unstable aortic aneurysm, current pneumothorax, recent surgery including ophthalmic, thoracic abdominal or neurosurgery

Relative Contraindications

- Suspected respiratory infection in the last 4-6 weeks
- Undiagnosed chest symptoms e.g. haemoptysis
- Any condition which may be aggravated by forced expiration e.g. history of prior pneumothorax; unstable vascular status such as recent (within 1 month) myocardial infarction, uncontrolled hypertension or pulmonary embolism or history of hemorrhagic event (stroke); previous thoracic, abdominal or eye surgery
- If the patient is too unwell to perform forced expiration
- Communication problems such as learning disability or confusion

Appendix 4 - Pre-Attendance Questionnaire

- Discuss the potential risks and benefits with patients to ensure informed decision making
- Ensure patients are informed not to attend the surgery if they have an acute respiratory infection)
- Consider screening for features of infection
 - Cough; flu like symptoms
 - Temperature ≥ 37.8
 - Loss of sense of smell / taste
 - Any similar symptoms in household members or regular contacts

Name	Role	Organisation

References

1. Sommer I, Griebler U, Mahlknecht P, Thaler K, Bouskill K, Gartlehner G, et al. Socioeconomic inequalities in non-communicable diseases and their risk factors: an overview of systematic reviews. *BMC public health*. 2015;15(1):1-12.
2. Sheikh S, Hamilton FW, Nava GW, Gregson FKA, Arnold DT, Riley C, et al. Are aerosols generated during lung function testing in patients and healthy volunteers? Results from the AERATOR study. *Thorax*. 2021:thoraxjnl-2021-217671.
3. UK Health Security Agency. Infection prevention and control for seasonal respiratory infections in health and care settings (including SARS-CoV-2) for winter 2021 to 2022 2022.
4. Sylvester KP, Clayton N, Cliff I, Hepple M, Kendrick A, Kirkby J, et al. ARTP statement on pulmonary function testing 2020. *BMJ Open Respiratory Research*. 2020;7(1):e000575.
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7. Levy ML, Quanjer PH, Rachel B, Cooper BG, Holmes S, Small IR. Diagnostic Spirometry in Primary Care: Proposed standards for general practice compliant with American Thoracic Society and European Respiratory Society recommendations. *Primary Care Respiratory Journal*. 2009;18(3):130-47.