

# Spirometry in primary care following the COVID-19 Pandemic

Spirometry is a component of the diagnosis and management of respiratory conditions in primary care and should ideally be performed via referral to a primary care network respiratory diagnostic service or community diagnostics centre (CDC) with expertise in the diagnosis of the most common respiratory conditions and of less common diagnoses. Where limited resources create a challenge for testing everyone with a new suspected diagnosis of asthma, those with an intermediate probability should be prioritised for spirometry and also FENO where available. Spirometry confirmation of COPD is mandatory before any definitive communication with a patient that they have this diagnosis. Spirometry should be delivered and technically reported by registered healthcare professionals with an appropriate level of expertise and experience.

## Background

Spirometry is a test used to measure lung volumes and air flow. Spirometry is a component of the diagnosis and management of respiratory conditions in primary care including asthma and chronic obstructive pulmonary disease (COPD). Spirometry can be used for monitoring conditions such as restrictive respiratory conditions, though this is not usually a primary care role.<sup>1,2</sup> Correctly performed and technically reported spirometry is essential to confirm suspected COPD.<sup>3</sup> The clinician exploring the cause of chronic and recurrent respiratory symptoms such as breathlessness, cough, 'chest infection' and wheeze should have ready access to spirometry to assist in the confirmation or exclusion of a suspected diagnosis.<sup>4</sup> Symptoms of COPD can overlap with many other conditions that have a normal or different abnormal spirometry finding. A suspected asthma diagnosis may require spirometry confirmation, especially if the clinical picture does not reach a high probability grade,<sup>5</sup> and is certainly required for practices looking to achieve the quality improvement targets of the Quality and Outcomes framework (QOF). There is a risk to diagnosing common respiratory symptoms without using spirometry in that inappropriate and potentially harmful interventions can be initiated with the potential to then delay the right treatment for the correctly diagnosed cause.

## History of spirometry in primary care

The widespread use of spirometry in primary care started in all four nations of the UK with the introduction of the Quality and Outcomes Framework (QOF) in 2004.<sup>6</sup> For the first time, payment to general practice surgeries was made if amongst other criteria there was spirometry confirmation of a suspected COPD diagnosis.

Over time, the availability, skills and knowledge within primary care to provide, perform and technically report spirometry increased. In 2016, the new NICE guideline on diagnosis and management of asthma<sup>1</sup>, recommended, albeit controversially,<sup>7</sup> that

spirometry should become a routine confirmatory test in the diagnosis of asthma. This guidance subsequently entered the QOF quality criteria (though Scotland no longer participated in QOF by this time and Wales had developed its own GP quality improvement system) for anyone receiving a new diagnosis of asthma from and beyond 2021;<sup>8</sup> "A record of spirometry and one other objective test (FeNO or reversibility or variability) between 3 months before and 6 months after diagnosis".

However, by this time it was becoming apparent that for COPD diagnosis, whilst the QOF data suggested a high usage of spirometry to confirm diagnosis, deeper analysis showed that evidence of spirometry performed and spirometry consistent with a COPD diagnosis were both much lower than QOF records suggested.<sup>9,10</sup> There was a realisation that a major quality improvement exercise would be required to ensure that people in primary care were universally trained to do spirometry correctly and safely and provide accurate technical reporting. This resulted in the development of the Association for Respiratory Technology and Physiology (ARTP) national certificate and register for competence in performing and technically reporting spirometry, that in England was subsequently adopted as a good practice standard by the Care Quality Commission (CQC).<sup>11</sup> The recognition of the burden of providing high quality spirometry for a primary care system that was increasingly under pressure and with the expectation of its more routine use in asthma diagnosis by NICE also meant that some practices were unable to fully deliver on the requirements and new models of delivering spirometry at population level started to be explored.<sup>12</sup>

## Safe spirometry and how COVID-19 has influenced service delivery

Safe spirometry has always required systems to manage the cross-infection risk caused by the droplets and aerosols

produced by coughing during the test and because of the use of equipment between users. Spirometry in itself is not an aerosol generating procedure but coughing during the manoeuvres is. Often the spirometry equipment and attached computer was insufficiently portable that the manoeuvres were carried out in a dedicated clinical room with patients being tested one after another in sequence. In primary care, clinical rooms can be very small and have limited ventilation.

The COVID-19 pandemic brought to the fore the risks of cross-infection for staff and patients co-existing in the spirometry test space. It became clear that much of the primary care buildings infrastructure was unsuited to spirometry testing and that the mitigations that needed to be put in place such as airing of the room between patients was often impractical because of limited clinical space and time.

During COVID-19, confirmation of diagnosis of COPD and asthma with objective tests including spirometry, microspirometry (not diagnostic quality), peak expiratory flow (PEF) and fractional exhaled nitric oxide (FENO) were greatly reduced or stopped altogether.

An audit by the Royal College of Physicians in Welsh primary care that started in 2013 and last reported in 2021 has shown that the use of spirometry for the diagnosis of COPD and asthma has been decimated since the pandemic.<sup>10,13</sup> This appears to be due to a combination of factors including retirement of skilled people without replacement, and because becoming trained, assessed and certified and engaging in self audit and update is considered too much of a barrier to overcome by many.

It is well established that COVID-19 exacerbated the effects of the health inequalities that exist in the UK.<sup>14</sup> It now appears that spirometry and FENO is also less available to those who need it most. Primary care services experience more pressure when they work with communities that have more health inequality. A recent report has shown that this has translated into less respiratory diagnostic availability for those more at risk, often due to higher tobacco use, poor indoor and outdoor air quality and poor housing.<sup>15</sup>

PCRS has recognised for some time that the delivery of spirometry to everyone who needs it has been unequal with variable training and access and has advocated a population-based approach with delivery of excellence through networks rather than relying on individual practices.<sup>12</sup> PCRS recognises that spirometry will still need to be carried out at practice level especially for rural and isolated communities either as part of a network approach or standalone but the standards of training and audit should be of an equivalent standard.

Where available, spirometry should be performed via referral to a primary care network respiratory diagnostic service or community diagnostics service (CDC) with expertise in the diagnosis of the most common respiratory conditions, asthma and COPD,

and of less common respiratory disease and non-respiratory causes of respiratory-related symptoms. This approach has the potential to avoid the need for referral to hospital-based secondary care services and to ensure maximum safety for patients and healthcare professionals undertaking testing procedures such as spirometry.

### **Spirometry for people with suspected asthma**

For children, young people and adults with suspected asthma, spirometry would, ideally form part of the structured diagnostic clinical assessment alongside a detailed history, examination and review of the patient's clinical records. It is important to note that even in a patient with a high probability for asthma based on clinical presentation, the spirometry may be normal if they are tested at a time when airways inflammation has subsided or if they have been treated with inhaled or oral corticosteroids whilst awaiting spirometry testing. Spirometry findings demonstrating airways obstruction and reversal can help support a diagnosis of asthma but a normal test cannot rule out a diagnosis and further spirometry testing or the use of peak flow diary monitoring and FENO would need to be used to provide additional objective data to provide more confidence in a diagnosis.

PCRS calls for sufficient funding of spirometry services so that anyone with respiratory symptoms suggestive of asthma should be able to access timely spirometry, if considered necessary. However, where resource limitations exist, diagnostic spirometry should be reserved for those patients with an intermediate probability of asthma.<sup>16</sup>

Patients with a high probability of asthma following a structured clinical assessment can be appropriately managed with a trial of treatment and with peak flow diary monitoring in the home environment.

### **Spirometry for people with COPD**

The diagnosis of COPD relies heavily on history but can only be formally diagnosed if fixed airflow obstruction without significant reversibility is demonstrated.

During the COVID-19 pandemic PCRS recommended that a tentative diagnosis of COPD could be made using PEFR measures with spirometry confirmation at a later date. This recommendation was based on a finding of a PEFR <75% predicted, as this suggests airflow obstruction, followed by serial measurements over 2 weeks confirming absence of variability and an insignificant response to salbutamol.

PCRS no longer recommends this approach. Spirometry confirmation of COPD is mandatory before any definitive communication with a patient that they have a COPD diagnosis. Microspirometry should not be used to confirm diagnosis as it is not designed for this function.

## Knowledge and skills required to perform spirometry

Spirometry should be delivered and technically reported by healthcare professionals with an appropriate level of expertise and experience and who are assessed and certified as competent. Some spirometry teaching courses offer training to an ARTP standard but do not provide an assessment and certification after training. PCRS recommends that assessment of learning and regular updates is an essential component of spirometry training. The National Register of Certified Spirometry Professionals and Operators<sup>17</sup> is the list of practitioners and operators who have demonstrated their competence in spirometry. To perform spirometry, healthcare professionals should attain the Foundation level of competency. To perform and technically report spirometry, full competency must be attained. An additional level of competency allows for healthcare professionals to technically report but not perform spirometry. PCRS would also recommend that spirometry service providers should perform regular audit and regularly reflect with specialist colleagues on their reports as part of ongoing professional learning and development.

Following technical reporting, a diagnosis will be considered and communicated and this should be performed by a health professional trained for this task. PCRS has developed a guidance document for commissioners and health professionals, Fit to care: key knowledge skills and training for clinicians providing respiratory care, that can help a diagnostic service that includes spirometry reflect on whether it is fit for purpose.<sup>18</sup> Asthma + Lung UK has also developed recommendations to help health professionals deliver a better diagnostic experience for people suspected to have a lung condition.<sup>13</sup>

Both before and after a spirometry test, people will need information to decide whether to do the test, be prepared for the experience of the test and to understand what the test results might show and how they may be interpreted by their diagnosing health professional. Asthma + Lung UK provide excellent resources that can help.<sup>19</sup>

## PCRS position

- Spirometry is a component of the diagnosis and management of respiratory conditions in primary care including asthma and COPD.
- Where spirometry is indicated this should ideally be performed via referral to a primary care network respiratory diagnostic service or community diagnostics centre with expertise in the diagnosis of the most common respiratory conditions, asthma and COPD, and of less common respiratory disease and non-respiratory causes of respiratory-related symptoms.
- Where limited resources create a challenge for testing every-

one with a new suspected diagnosis of asthma, people with suspected asthma with an intermediate probability should be prioritised for spirometry and also FENO where available.

- PCRS no longer recommends making a tentative diagnosis of COPD using PEFR diary monitoring. Spirometry confirmation of COPD is mandatory before any definitive communication with a patient that they have a COPD diagnosis. Microspirometry should not be used to confirm diagnosis as it is not designed for this function.
- Spirometry should be delivered and technically reported by registered healthcare professionals with an appropriate level of expertise and experience.

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