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ASTHMA+ LUNG UK

Diagnosing the problem:

RIGHT TEST, RIGHT TIME


AeroChamber

Contents

Foreword

This report focuses on access to key diagnostic tests for the UK's two most common lung conditions within primary care in England, asthma and chronic obstructive pulmonary disease (COPD). It makes the case for the need to ensure the timely and accurate diagnosis of respiratory conditions, and why this should be prioritised, despite the difficult financial situation, as investing in diagnosis is cost effective to the NHS in the long term.

Lung conditions are the third biggest killer in the UK. Spirometry, a crucial test for the diagnosis of asthma and COPD, was paused in primary care during the pandemic, resulting in a 51% reduction in COPD diagnoses in 2022.[1] For a number of reasons, the restart of spirometry has been extremely patchy. While there is no data available on this issue (which is itself part of the problem), we know that in some areas there is still very little activity, although other areas have successfully restarted spirometry. We also know that there were problems pre-pandemic with quality-assured spirometry being accurately and uniformly performed as part of diagnosing lung conditions such as asthma and COPD.

Poor lung health is a huge driver of inequality. People living in the poorest communities are twice as likely to develop a lung condition and seven times more likely to die from a lung condition.[2,3] Many areas with the highest rates of emergency admissions and mortality from lung conditions are also those with higher levels of deprivation.[4,5]

Accurate and timely diagnosis of respiratory disease requires primary care pathways that ensure prompt access to crucial diagnostic tests, such as spirometry and fractional exhaled nitric oxide (FeNO) testing for asthma and COPD.

We are fighting for the prioritisation of early and accurate diagnosis of respiratory conditions. This will require funding solutions such as commissioning or other incentives. The clear and accessible clinical best practice case studies discussed in this report demonstrate how this can be achieved in practice.

This report also examines how the establishment of Integrated Care Systems (ICSs) provides greater scope for local planning to meet the needs of local populations.

This report outlines that Community Diagnostic Centres (CDCs) are intended to add capacity, not replace it from primary care. Action is still needed elsewhere in primary care and services should not rely on CDCs to meet diagnostic demand in their area.

Forthcoming developments such as the **pre-diagnosis breathlessness pathway Diagnostic Pathway Support Tool**,[6] and the use of AI in spirometry, promise improvements to timely and accurate diagnosis. However, those working in diagnostic testing in primary care in England should not wait for alternative solutions to be developed, as action is needed now.

Sarah Woolnough
Chief Executive, Asthma + Lung UK

Executive summary

Accurate and timely diagnosis of respiratory disease requires primary care pathways that ensure prompt access to diagnostic tests, in particular spirometry and fractional exhaled nitric oxide (FeNO) testing for asthma and chronic obstructive pulmonary disease (COPD), the two most common lung conditions in the UK.

Early and accurate diagnosis of respiratory conditions should be prioritised. This will require funding solutions such as commissioning or other incentives. Our clear and accessible clinical best practice case studies demonstrate how this can be achieved in practice.

This report also discusses how the establishment of ICSs provides greater scope for local planning to meet the needs of local populations.

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Forthcoming developments such as the **pre-diagnosis breathlessness pathway Diagnostic Pathway Support Tool**,[7] and the use of AI in spirometry, promise improvements to timely and accurate diagnosis. However, those working in diagnostic testing in primary care in England should not wait for alternative solutions to be developed, as action is needed now.

Barriers to the delivery of key diagnostic tests

Diagnostic tests such as spirometry are not being performed universally across primary care at the moment. Key barriers to the provision of spirometry and FeNO testing include workforce and equipment issues (including training), funding (commissioning), challenges with guidelines and certification, as well as lingering estates/spaces and infection prevention and control issues post pandemic.[8]

During the pandemic there was uncertainty around whether tests like spirometry were an aerosol generating procedure (AGP), which led to services being paused due to concerns around estates and spaces, and infection prevention and control. However, **clear guidance** now states that it is safe to restart spirometry, and there is an urgent need to restore universal access to quality-assured spirometry for all who need it.[9] To remedy this, spirometry must be provided in primary care.

This report aims to identify potential solutions to these common barriers, as follows:

1. Workforce and equipment: Some areas may use a lower-band (3/4) member of staff (possibly through the Additional Roles Reimbursement Scheme (ARRS)) who is trained to deliver the tests and a higher-band (6/7) colleague for interpretation or reporting. See case study three, pp. 27-28 (Open Door Surgery, Balham).

2. Training and accreditation: funding training is key. Case study four, pp. 33-34, describes the work Wessex Academic Health Science Network (AHSN) have done to lead Accelerated Access Collaborative (AAC) work on FeNO testing.

3. Estates, spaces and infection prevention and control: managing COVID-19 as endemic is now recommended, as with any other respiratory infections in winter. Where clinical space is a challenge, weekend clinics like the one described in case study three, pp. 27-28, can help to address this, as

spirometry clinics can be arranged when there is less competition for clinical space. Another solution is travelling diagnostic vans, outlined in case study five, pp. 36-37.

4. Lack of funding for spirometry: this remains the biggest barrier in many areas. The Gloucestershire Local Enhanced Service (LES) discussed below in case study six (pp. 39-40) is run as a not-for-profit paid-for service.

Key policy recommendations

- **Prioritise respiratory health at ICS level:** Each area should have a local policy about respiratory testing that ensures that NICE guidelines are followed.
- **Integrated Care Boards (ICBs) should develop business cases for respiratory diagnostics** in their area, assessing local need and investing the necessary resources and training, knowing that this is cost effective. If this requires dedicated funding, this should be prioritised.
- Ensure **a respiratory lead in each ICS**.
- **Workforce:** ICBs should have a clear and strategic view of current and future demand on their service and should plan to adequately meet this demand for their population, ensuring that there is an appropriately qualified workforce in place.
- Current practice shows that a number of workforce models are being implemented successfully. ICBs should identify which model will suit their area best.
- **Training:** ICBs should prioritise delivery of training to ensure respiratory workforce are able to perform/interpret spirometry results with appropriate certification.
- **Estates and Infection Prevention and Control (IPC):** read the latest guidance on managing the risk of respiratory infection as endemic and ensure universal access to quality-assured spirometry for all that need it.
- **Funding spirometry:** specific funding is needed to improve spirometry training at primary care level.
- Recognise all costs involved for any provider who wants to provide respiratory tests.
- Develop local payment mechanisms to ensure no one is disadvantaged by setting up a service to meet local needs. Funding should be made available via GP or PCN contracts, or any other suitable mechanisms.
- Ensure that all patients have equitable access to these tests with appropriate governance around the quality of provision and interpretation.
- Providers also need scope to use funding allocated for spirometry training more broadly to cover costs of overheads. Greater flexibility for ICBs to allocate funding where it is most needed would be much more useful.
- Spirometry should be incentivised as a paid-for diagnostic test within the GP contract, until a standardised national or guide tariff for diagnostic testing for different settings can be developed.
- **The role of CDCs:** ICBs should take the role of CDCs carefully into account, ensuring integrated provision across primary care. CDCs should not be relied upon as the sole provider of respiratory diagnostic tests.
- We ask your ICS to restart quality-assured spirometry in primary care in full by the end of the 2023/24 financial year, and to ensure that these tests are available at all community diagnostic hubs, regardless of size or classification.
- NHS England should provide clear guidance that CDCs are intended to boost diagnostic capacity alongside provision in primary care and are unlikely to be able to deliver all respiratory diagnostic testing, even when fully up and running.
- **Targeted Lung Health Checks (TLHCs):** people presenting to TLHCs with respiratory symptoms should have spirometry performed, as per the recommendation in the TLHC national protocol. This is a diagnostic test, not screening.
- **Children and Young People (CYP):** recommendations on early and accurate diagnosis within the NHS

England National Bundle of Care for Children and Young People with Asthma should be kept up to date and implemented universally.

- To address training and registration issues, ARTP (Association for Respiratory Technology & Physiology) should consider making combined certification available for both adults and children and young people, to recognise the skills and experience gained by providing one service and encouraging this to be applied in practice to all people with lung conditions who are able to complete testing, irrespective of their age.
- **Future developments: swift introduction of the new pre-diagnosis breathlessness pathway for adults:** we need to see wider promotion and roll-out of this pathway within ICSs within the next 12 months, to ensure widespread uptake so people with lung health conditions have more consistent and rapid access to diagnosis.
- The results of the pilots of the breathlessness pathway must also be analysed by NHS England as soon as possible, to scope out and understand the staffing models needed so the pathway can enable rapid diagnosis for all those who need it.
- **Research:**
  a) Investigate the best ways to train staff / support them to interpret results.
  b) Investigate possibilities around home monitoring / digital testing.
  c) Investigate service delivery, to establish how different models may work best for varied local settings.

Introduction

People with lung conditions are waiting too long for a formal diagnosis. Timely and accurate diagnosis is key because without this, people with conditions such as asthma and chronic obstructive pulmonary disease (COPD) cannot access the right care and treatment that they need to improve symptoms and prevent acute or long-term deterioration. A delayed diagnosis may limit a person's quality and even length of life. The right diagnosis and treatment are key in order to keep people with lung conditions well and out of hospital.

In addition, timely and accurate diagnosis is also better for NHS systems, both for general practice at a local level and for the system as a whole. This is because inappropriate treatments may be harmful and add unnecessary additional cost to the NHS. As such, the importance of timely and accurate diagnosis is recognised in the **NHS Long Term Plan**,[10] and also included in the Quality and Outcomes Framework (QOF).[11]

Impact of asthma

Asthma affects the airways that carry air in and out of a person's lungs, as people with asthma often have sensitive, inflamed airways. This causes symptoms like coughing, wheezing, feeling breathless or a tight chest. It impacts the daily life of people affected, including education and work.

- Asthma is the most common lung condition in the UK, affecting 5.4 million people (one in every 12 adults and one in every 11 children).[12]
- Asthma accounts for 2–3% of primary care consultations.
- There are 60,000 hospital admissions and 200,000 bed days for asthma per year in the UK.[13]
- Asthma attacks kill three people in the UK every day, and someone has a potentially life-threatening asthma attack every 10 seconds.[14]

Key interventions such as early diagnosis to improve treatment and care can make many of these severe attacks and deaths avoidable.

Impact of COPD[15]

Chronic obstructive pulmonary disease (COPD) is the name for a group of conditions where it's difficult to breathe air out of the lungs. In COPD, air cannot get out of the lungs easily because the airflow is obstructed in airways that are narrowed. COPD can cause symptoms such as breathlessness, coughing, wheezing or coughing up more phlegm than usual.[16]

- More than 1.4 million people are diagnosed with COPD. It is estimated that about as many could be undiagnosed.
- In 2016 there were approximately 1.4 million GP consultations for COPD, accounting for around 0.5% of all appointments.[17]
- 2% of the UK population has a diagnosis of COPD, including 4.5% of those over 40.[18]
- Treating COPD costs the NHS £1.9 billion a year.
- COPD causes 30,000 deaths and 130,000 emergency hospital admissions every year.

Although the severity of symptoms with COPD can vary, COPD can impact a person's life and impose restrictions on their way of life in many ways. Many people with COPD reduce their working hours, retire, or die earlier than others without the condition.

Provision of basic care for both conditions is extremely poor:

	A+LUK patient survey/primary care	NACAP 2022 audit/secondary care
COPD	**18.4%** respondents reporting best practice care.*	**18.7%** of adults in hospital with COPD received all mandatory elements of care as defined by the COPD Best Practice Tariff for delivering set elements of care.
Asthma	**30%** respondents reporting best practice care in 2022.*	**30.1%** of adults received all mandatory elements of care as defined by adult asthma bronchial provocation testing (BPT) during their hospital admission.

*Best practice defined as:
For COPD: those receiving the 'Five Fundamentals' of COPD care as outlined by NICE.

For asthma: those receiving an annual asthma review, inhaler technique check and written action plan.

The role of secondary prevention
Secondary prevention is now a developing agenda and focus for NHS England. There is an increasing drive to reduce the impact of a disease or injury, such as a lung condition, by keeping people with these conditions well and out of hospital. In spring 2023, NHS England published details on **high impact interventions for the diagnosis and treatment of respiratory conditions** which include the use of spirometry to diagnose asthma and chronic obstructive pulmonary disease (COPD), inhaler and medicines optimisation, pulmonary rehabilitation (PR) for COPD, and personalised asthma action plans for all children and young people with asthma.[19]

This guidance makes it clear that these interventions are likely to provide a positive return on investment and reduce future demand on NHS services, and they are also likely to lead to better patient outcomes and experiences.

It should be noted that the **23/24 Priorities and Operational Planning Guidance** includes a commitment to "increase the percentage of patients that receive a diagnostic test within six weeks in line with the March 2025 ambition of 95%".[20] Respiratory patients will of course be included within this, and areas not offering adequate respiratory diagnostic capacity will struggle to meet this target.

This report focuses on spirometry and FeNO testing as key examples of diagnostic tests for common lung conditions (asthma and COPD).

What is spirometry?[21]
Spirometry is a breathing or a lung function test. It measures how much air someone can breathe out in one forced breath, allowing for the assessment of forced expiratory volume in one second (FEV_1) and

forced vital capacity (FVC), the maximum amount of air that can be exhaled when blowing out as fast as possible.[22]

Spirometry is recommended in NICE guidelines[23,24] for the diagnosis of both chronic obstructive pulmonary disease (COPD) and asthma. Spirometry is often done alongside a bronchodilator reversibility test (BDR), to show if and how much a person's airways improve with bronchodilator medicines.

Spirometry and BDR testing can show normal results, obstructive, or restrictive patterns, or a combination of the latter two. An obstructive result indicates a lung condition that narrows the airways, such as COPD or asthma, whereas a restrictive result demonstrates that the total amount of air someone can breathe in is reduced, because their lungs cannot fully expand. A combined result means that both the total amount of air, and how fast a person can blow it out, are both reduced.

What is FeNO testing?[25]

FeNO stands for fractional exhaled nitric oxide. FeNO is a test that measures the levels of nitric oxide in someone's breath. A high level of nitric oxide when they breathe out can be a sign that they have inflamed airways, due to asthma. As such a FeNO test is used to help diagnose asthma, alongside taking a medical history, and other tests such as spirometry or peak flow tests.

A FeNO test is suitable for adults and most children over five. By showing how inflamed a person's airways are, FeNO testing can help work out whether they have allergic or non-allergic asthma. This is because levels of nitric oxide in someone's breath are higher if they have certain types of allergic asthma. Although NICE guidelines for the diagnosis of asthma[26] recommend FeNO testing, FeNO is currently optional within the Quality and Outcomes Framework (QOF).[27]

Waiting Well: actions to take whilst awaiting objective diagnostic tests or results

For healthcare professionals:

- Rule out red flag symptoms which would require more urgent assessment.
- Advise patients on smoking cessation, keeping active and staying a healthy weight.
- Encourage patients to keep a symptom diary, or a peak flow diary in cases of suspected asthma.
- Continue usual medications, unless one is felt to be contributing to symptoms.
- Provide safety net advice: ask patients to seek further advice for new or worsening symptoms.
- Signpost the person to **resources** (see below) about the suspected diagnosis or tests they are being referred for.
- Agree correct clinical coding where there is no confirmed diagnosis to enable patients (especially children) to be tracked whilst they are waiting for tests and later followed up.

For people with a suspected lung condition:

- For advice, call our helpline on **0300 222 5800**. Lines are open 9am–5pm, Monday to Friday. You can also email us via **helpline@asthmaandlung.org.uk**
- **Join a support group** online or near you.
- Read our webpages on **COPD here** and **asthma here**.
- Read our webpages on **breathlessness here**.

Chapter One: The Importance of Diagnostic Testing

Accurate and timely diagnostic testing is essential for basic respiratory care[28]
People with breathing difficulties often wait years to receive a formal diagnosis. This is because key symptoms such as breathlessness are not always taken as seriously as they should be, and lung conditions are under-researched and underfunded compared to other conditions. There is a lack of public awareness about when to seek help, as these conditions do not receive the attention they deserve.

Even once a person with respiratory symptoms seeks help from a healthcare professional, diagnosis is still too slow. People are waiting too long in between appointments and for crucial tests.

For example, out of those surveyed by A+LUK in 2023 who had been diagnosed with a lung condition in the past two years in England:

- **36.8% waited for more than 6 months between first raising their symptoms with a healthcare professional and receiving a diagnosis**.
- **Only 58.8% had heard of their lung condition** before their diagnosis.
- **Barriers to diagnosis** highlighted by our survey respondents diagnosed in the past two years in England **include: lack of availability of diagnostic tests (18.2%), misdiagnosis (18.2%), lack of awareness of symptoms (17.5%), and symptoms being identified as a cough or chest infection or something else at first by healthcare professionals (39.1%)**.

In addition, our survey of people with COPD last year showed:

- **Almost a quarter of people (nearly one in four) surveyed had waited five years or more for a diagnosis**.
- Shockingly, **12.4% of respondents (one in eight) had symptoms for more than 10 years before they received a diagnosis**.
- More than a third (34%) of people surveyed said they were unable to recognise the signs of COPD, and around 1 in 4 (23%) said they were misdiagnosed as their doctor thought they had a chest infection or cough.
- Other key problems included access to care, with 1 in 4 (26%) people saying they couldn't get an appointment and 1 in 5 (21%) being unable to access key tests, such as spirometry, which are essential for an accurate diagnosis.[29]

KATY'S STORY

Katy, a retired nursery nurse from Bristol, was diagnosed with COPD in February 2021.

She says: "I first noticed symptoms of what would turn out to be COPD in 2019, but it took three years to get a spirometry test to confirm it or how well my lungs are coping.

It's very frustrating not to have the information you need, especially when early diagnosis and action can halt the decline.

There's been a lot of back and forth with multiple doctors, trying to work out what was causing my breathlessness. I've had to fight for answers every step of the way. That can be exhausting.

I initially saw a nurse in 2019 because I had a persistent chest infection. The first time a doctor mentioned COPD was in September 2020, but it took until February 2021 to speak to a COPD nurse over the phone who confirmed my diagnosis, and that took a lot of chasing.

Because we were in the middle of the pandemic, I didn't have a spirometry test to check on the state of my lungs or pulmonary rehabilitation until 2022, which has made a big difference.

I was actually referred to a respiratory consultant in May 2022 but despite chasing up eight times, I have still not yet seen anyone, as I have had two appointments cancelled, and I am back on the waiting list. I am therefore still waiting for a proper diagnosis to ensure I am on the correct medication and treatment plan.

Everything about my COPD experience has been an absolute battle. I honestly believe that if I wasn't such a forceful character, I wouldn't even be on a waiting list to see a specialist.

I know I am one of the lucky ones, but there are so many people with COPD who are simply being left behind, and that isn't right. Nobody should have to fight to get a diagnosis or basic levels of care."

To see Katy speak about her story, watch the recording of the Taskforce for Lung Health Future of Spirometry webinar recording from December 2022 **here** (12–20 minutes).[30]

It is important that everyone with symptoms of a suspected lung condition gets a diagnosis, in as timely a manner as possible. Without an early and accurate diagnosis, people cannot access the right care and treatment that they need. Inappropriate treatments may be harmful and add unnecessary additional cost to the NHS (see section on 'Cost effectiveness and other benefits of timely and accurate diagnosis' below, pp. 18-20 for more details). A delayed diagnosis may limit a person's quality and even length of life.

This situation was challenging before the COVID-19 pandemic,[31] and now, due to the additional pressure placed on respiratory services, many thousands of people are waiting far too long for the diagnosis they need. For example, new COPD diagnoses fell by 51% as a result of the pandemic.[32]

The importance of early and accurate diagnosis is recognised in the national respiratory priorities in the **NHS Long Term Plan**,[33] and also included in the **Quality and Outcomes Framework** (QOF).[34]

There are three changes to respiratory indicators for QOF this year:

- **Asthma:** inhaler technique must be checked by observation in a face-to-face appointment, or by video where that is not possible.
- **COPD:** if a patient is on inhalers, their inhaler technique must be checked by observation in a face-to-face appointment, or by video where that is not possible.
- **COPD:** if their breathlessness is MRC grade 3 or more at any time in the last 12 months the patient should be referred to (not just offered) pulmonary rehabilitation (PR).[35]

Face-to-face inhaler checks will cause disruption to how primary care has been conducting reviews over recent years, as this prevents clinicians from tailoring their approach according to need. There is no stipulation that this must happen on the same day as the asthma review (unlike action plans). An increase in referrals to PR may add pressure to services where capacity is already stretched and will also require

greater clinical awareness in order to inform patients adequately.

It should also be noted that the **23/24 Priorities and Operational Planning Guidance** includes a commitment to "increase the percentage of patients that receive a diagnostic test within six weeks in line with the March 2025 ambition of 95%".[36] Respiratory patients will of course be included within this, and areas not offering adequate respiratory diagnostic capacity will struggle to meet this target.

Enabling secondary prevention

As indicated above, secondary prevention is now a developing agenda and focus for NHS England. There is an increasing drive to reduce the impact of a disease or injury, such as a lung condition, by keeping people with these conditions well and out of hospital. In spring 2023 NHS England published details on **high impact interventions for the diagnosis and treatment of respiratory conditions** which include the use of spirometry to diagnose asthma and chronic obstructive pulmonary disease (COPD), inhaler and medicines optimisation, pulmonary rehabilitation (PR) for COPD, and personalised asthma action plans for all children and young people with asthma.[37]

LAUREN'S STORY

Lauren, an IT trainer from Nottingham, was diagnosed with asthma in 2010.

"It was around 2010 when I first started experiencing symptoms of asthma. I would get breathless doing light exercise or even climbing stairs, which was unusual for me. It was only when I went out for a jog with my brother and had to turn back due to severe breathing difficulties, that I went to see a doctor. They gave me a blue inhaler. I ended up going back to the doctors because it did work but it was short lived, because it's only a reliever. It was then that I was given the preventative inhaler. When that started working, I had a spirometry test, which then confirmed that yes, I definitely have asthma.

However, it wasn't until I had an asthma attack in 2019 that I was finally referred to a specialist in an asthma clinic. It was only then that I received the combination of medication that actually worked and stabilised my condition.

At one point, I was even given a pack of steroids to keep at home in case of emergency. Looking back, I know that probably wasn't the right thing to do. Instead, I should have been referred to a specialist to explore other treatment options. I didn't know at the time, but now I realise that earlier intervention and better information could have made all the difference. Looking back, I realise that my asthma could have been diagnosed sooner.

It was a shock when I ended up in the hospital due to my asthma. I never imagined it would happen to me. But it made me realise that asthma is a serious condition that requires proper management and treatment. If I'd appreciated how bad it could get, I might have asked my GP for better treatment options. It's given me confidence as well, to say to a medical professional, 'This is an asthma attack, I've experienced this before' and get the right help sooner.

I was lucky enough to have an asthma nurse, but not everyone has access to these resources. Patients with asthma should be contacted and informed about their options, and sent to see a specialist, especially if their asthma is uncontrolled. There should be a pathway in place where patients are sent to a specialist who can explore treatment options, investigate potential triggers, and identify the type of asthma they might have.

It's important to provide reliable information to patients with asthma. When I was first diagnosed, I didn't really understand my condition. Knowing what I know now, I want to help other people get the right treatment."

NHS England guidance[38] makes it clear that these interventions are likely to provide a positive return on investment and reduce future demand on NHS services, and it should also be pointed out that they are likely to lead to better patient outcomes and experiences too. The right diagnosis and treatment are key in order to keep people well and out of hospital, and to be able to impact people's quality of life in a meaningful way.

Getting the basics right: Guidelines on diagnostic tests for asthma and COPD

- **Tests for diagnosing asthma**

Regarding spirometry for asthma, the National Institute for Clinical and Health Excellence **(NICE)** indicates:

> "1.3.5 Offer spirometry to adults, young people and children aged 5 and over if a diagnosis of asthma is being considered."[39]

In addition, for the diagnosis of asthma, **NICE guidelines** state:

> "1.3.2 Offer a [fractional exhaled nitric oxide] FeNO test to adults (aged 17 and over) if a diagnosis of asthma is being considered...
>
> 1.3.3 Consider a FeNO test in children and young people (aged 5 to 16) if there is diagnostic uncertainty after initial assessment and they have either:

- normal spirometry or
- obstructive spirometry with a negative bronchodilator reversibility (BDR) test."[40]

Clinicians may also find it useful to refer to Global Initiative for Asthma **(GINA)** guidelines on the role of lung function testing to document variable expiratory airflow limitation.[41]

Tests for diagnosing COPD

NICE guidelines outline that spirometry should be performed:

- at diagnosis
- to reconsider the diagnosis, for people who show an exceptionally good response to treatment
- to monitor disease progression.[42]

In addition, NICE highlights that:

> "1.1.8 All healthcare professionals who care for people with COPD should have access to spirometry and be competent in interpreting the results...
>
> 1.1.9 Spirometry can be performed by any healthcare worker who has had appropriate training and has up-to-date skills...

1.1.10 Spirometry services should be supported by quality control processes."[43]

Action is needed on guidelines

We expect to see the further development of these guidelines in the forthcoming joint NICE, British Thoracic Society (BTS) and Scottish Intercollegiate Guidelines Network (SIGN) guideline in development for asthma: diagnosis, monitoring and chronic asthma management, expected for publication in summer 2024,[44] and in the planned update to the Quality Standard for COPD in adults, which was due to be published in January 2024, until its recent suspension.[45] Spirometry and FeNO testing should be included within guidelines not only for diagnosis, but also for monitoring to enable medicine adherence.

In 2020, a lack of spirometry testing contributed to a 51% reduction in COPD diagnosis, while research indicates there were 107,000 fewer asthma diagnoses in England between March 2020 and December 2021. Worryingly, however, only 15% of people with asthma we surveyed last year had ever heard of a FeNO test,[46] which suggests that many people are being diagnosed without the recommended tests. There could also be a place for FeNO in the diagnostic workup of people with suspected respiratory disease, to rule out allergic asthma before considering other diagnoses.

In the meantime, a key issue is that guidance is not being followed. Too many diagnoses are incorrect because they are made without objective testing, which may be harmful to patients. There are several barriers and enablers to conducting spirometry testing for suspected asthma or COPD in primary care which should be addressed.[47]

More work is needed to avoid a "nihilistic" medical approach to conditions like COPD. Focusing on quality of life rather than death rates is recommended, as there are bigger gains to be made here, e.g. through rehabilitation. Quality of life is hard to prove through qualitative research but could be measured by proxies such as breathlessness and its impact.

For healthcare professionals, guidelines indicate best practice as follows:

- Spirometry should be offered promptly to all individuals presenting to primary care with a history of persistent breathlessness or sputum production.
- People presenting with acute respiratory problems and risk factors should be offered spirometry.
- Ensure FeNO testing is available to all patients where asthma is being considered.
- Diagnostic testing must always include documentation of smoking status and offer referral to smoking cessation support.
- Before diagnosis, all people for whom a diagnosis of respiratory disease is being considered should be signposted to **A+LUK resources** to help them to be well-informed and empowered.[48]
- Deal with the backlog: reduce the number of people with a diagnosis of COPD where diagnostic spirometry has not been carried out to <5% by the end of 2024.
- After diagnosis, all people with a diagnosis of COPD or asthma should be signposted to and encouraged to engage with **A+LUK resources**, including inhaler technique videos and patient passports for their condition.[49] These resources will help them to be well informed and also empower them to identify gaps in their care and ask for them to be addressed.

Cost effectiveness and other benefits of timely and accurate diagnosis

According to NHS England, "The annual economic burden of asthma and COPD on the NHS in the UK is estimated as £3 billion and £1.9 billion respectively... Both under and over diagnosis of respiratory conditions leads to delayed treatment and increased chance of acute admissions."[50]

For example, late COPD diagnosis is associated with increased exacerbations, co-morbidities, and costs.[51]

Research shows that "[m]oderate-to-very severe COPD represents a considerable economic burden for healthcare providers despite the availability of efficacious treatments and comprehensive guidelines on their use."[52] Early and accurate diagnosis can reduce the burden of exacerbations and the costs of the condition for the NHS (the NHS spends more than £800 million on direct COPD costs annually).[53] Research suggests that if COPD patients were treated according to NICE guidance, this would result in an estimated **"annual reduction in expenditure of £46.9 million, giving total cost savings of 8% of the cost of current practice."**[54]

- 67% of patients present to healthcare 3 or more times with a COPD indicator in the 5 years preceding diagnosis.[55]
- 10–34% of COPD admissions a year are in people who have not been previously diagnosed.[56]

We are concerned about the misdiagnosis of people with asthma and COPD. 18.2% of people diagnosed with a lung condition in England in the past two years who were surveyed by A+LUK in 2023 identified misdiagnosis as a barrier to their diagnosis. As many as 30% of people diagnosed with asthma may not actually have asthma.[57] It is clear that misdiagnosis is partly due to the lack of availability of spirometry tests. We are also worried that many people with lung disease are not being diagnosed at all.

It is crucial that a good clinical history and examination is supported by objective evidence of inflammation (FeNO testing) and airway obstruction (spirometry or peak flow testing). Without this extra evidence, there is a greater risk of incorrect diagnosis. Under-diagnosis can lead to people having untreated inflammation, putting them at risk of asthma symptoms and asthma attacks. Overdiagnosis means that people are getting medications they do not need, with the chance of side effects and at a cost to the NHS. It also means they are not getting the treatment they do need for their symptoms. Correct diagnosis is "also an important factor in addressing health inequalities[,] given we know [that] incidence for those with respiratory disease is higher in disadvantaged and protected groups and areas of social deprivation."[58]

Using diagnostic testing to enable early and accurate diagnosis is not only recommended by clinical guidelines, but also more cost effective to the NHS in the longer term. People with an accurate diagnosis and the right medication and other treatment are less likely to have costly unplanned hospital admissions, and this could both improve outcomes and reduce future demand on the NHS in the longer term.

Misdiagnosis may also mean that crucial funds are spent on inappropriate and ineffective medication:

> "Over 5.4 million people in the UK live with asthma, with the NHS spending £1.1. billion on asthma treatment and management annually. 90% of this cost goes directly on asthma medication, including the high prescription of steroid inhalers… 30% of patients are suspected to have been misdiagnosed; yet there is no single test that can definitively diagnose asthma."[59]

Action to optimise medication use after a correct diagnosis, especially inhalers, could improve control of the condition for many people, as well as reduce exacerbations and excess deaths. This could also be better for the environment by allowing for greener prescribing where appropriate. By reducing misdiagnosis, the NHS could save an estimated £1.5–7.5 million per annum.[60]

Earlier detection of conditions like asthma and COPD also allows for the targeted use of evidence-based primary and secondary prevention clinical interventions, such as smoking cessation services and pulmonary rehabilitation.

It should be noted that the costs of tests in Community Diagnostic Centres may be more expensive than the cost-per-head at practice level, depending on differences in overheads. Therefore, depending on service model, some areas may be able to provide these tests for a lower cost than others, irrespective of any national tariff. Consequently, this represents a cost saving or increased capacity for the same price, especially where Community Diagnostic Centres (CDCs) may have too limited a capacity to provide all tests for their local area. Primary care might be well placed to provide cheaper diagnostic tests for respiratory

conditions, where funding is available.

It is also important to note that costs should be budgeted to include consumables, and may vary, depending on the setting. Commissioning of diagnostic testing services must take all of this into account to ensure a viable service.

Ultimately the cost must be funded to allow the provision of needed care to patients. However, if tests can be funded more cheaply elsewhere in primary care, such as at a practice level, it will be worth commissioning these services in-house, rather than referring patients elsewhere to have these tests done in settings such as CDCs, which will be more costly to the NHS in the long term.

The early and accurate diagnosis working group being developed by NHS England aims to compile resources for ICBs and commissioners, including information on models and costing. This should provide clarity on how to commission and deliver tests such as spirometry in a cost-effective way. Available evidence suggests that spirometry is likely to be cost-effective.[61]

In addition, more effective treatment is also likely to significantly improve patient quality of life, as the impact of their symptoms and condition on their daily life is minimised. This can help to avoid a cycle of decline where smoking leads to increased breathlessness, mental health issues, decrease in physical activity and increased social isolation. People diagnosed with lung conditions can access treatment, education, and self-management programmes to help improve their condition and minimise its impact.

Although there may be limited evidence on the cost-effectiveness of early diagnosis as a whole, there is established proof about specific interventions, such as mental health support. Once a diagnosis is known, it is possible to use specific interventions for better outcomes that could not be considered otherwise, such as treating exacerbations,[62,63] vaccinations,[64,65] smoking cessation[66] and pulmonary rehabilitation,[67] alongside other treatments.[68,69]

Without accurate, timely diagnostic testing, people with lung conditions live in limbo struggling with debilitating symptoms, including breathlessness, and not getting the help they need to stay well and out of hospital. It's vital that people get diagnosed quickly – but we know, because of the pandemic, too many are falling through the gaps and are undiagnosed, missing out on the help they urgently need.

CLAIRE'S STORY

Claire, a project development coordinator from Cumbria, was eventually referred to secondary care, which gave her access to improved treatments for better asthma control.

"I was diagnosed with asthma 20 years ago now. I remember it was just after I turned 30. We don't know what caused it. It took a while to be told, 'Yes this is asthma and it's not going away.' There have been a few ambulance trips, with blue lights and admissions to hospital, which obviously was very scary. Then it seemed to settle down for a bit.

Just before the pandemic, my asthma control worsened. I was on and off steroids every few months and couldn't maintain any improvement once I was off the steroids. My GP practice kept doubling my inhalers and adding this and that, until eventually they said, 'There's nothing else we can give you, we don't know what to do, we'll send you to secondary care.' Once there, I was given tests, and I was diagnosed with severe asthma and started on biologics.

Suddenly, after nearly two decades of being fairly stable, it had gone absolutely chaotic. I spoke to my consultant about it. I told them, my symptoms seem to be linked to hormonal changes.

It took several decades before I was correctly diagnosed with a specific type of asthma and the impact of the menopause on my asthma was recognised, which meant I wasn't given the right treatment for a long time. It's been really difficult not getting the right treatment and information. But if I'd been referred to secondary care much sooner, they would have looked at alternatives to steroids, which would have been better for my health.

So many things would have made my experience better. A patient education system would have been great. I now have an asthma plan, but I didn't have one for years, so I'd end up having a severe asthma attack, start on steroids, and sometimes have to ring an ambulance and end up in hospital. Looking back, I dread to think what damage could have been done.

If I had been referred to secondary care sooner that would have made a difference. Finally seeing a consultant and getting the right diagnosis led to reducing my steroid use which has been great for me."

It is important to note that many of those without a diagnosis are not asymptomatic, as there is often a disease burden that goes undetected until a late stage.[70] If patients presented and were diagnosed earlier, they could benefit from interventions such as treatment for flare ups, vaccinations, and smoking cessation advice, as outlined above. Symptoms of lung disease are often ignored or minimised by patients and clinicians and typically many opportunities to make a diagnosis are missed before this finally occurs.[71] Due to a lack of awareness, many people may present to primary care at a late stage with more severe symptoms that would benefit from earlier treatment to address deprivation and inequalities.

Policy recommendations

For ICBs/ ICSs:

- We want to see respiratory health prioritised in ongoing Integrated Care Board and Partnership plans.
- To ensure respiratory care is prioritised at ICS level we ask for your system to ensure there is an accountable officer responsible for lung health outcomes that reports into the ICB.
- Each area should have a local policy about respiratory testing that ensures that NICE guidelines are followed.
- We would like to see a clear respiratory plan that supports the priorities outlined in NHS England's long-term plan which can flex to include the plans to be set out in the Department of Health and Social Care's major conditions strategy later this year.
- CDCs should not be relied upon as the sole provider of respiratory diagnostic tests (see Chapter Two, section 6, pp. 43-45).
- ICBs should develop business cases for respiratory diagnostics in their area, assessing local need and investing the necessary resources and training, knowing that this is a cost-effective use of resources.[1] If this requires dedicated funding, as described in case study six, pp. 39-40, (Gloucestershire LES), this should be prioritised.
- Ensure there is a respiratory lead in each ICS with responsibility for presenting and addressing data on diagnosis, quality of care and outcomes for people with respiratory disease.

[1]See information about the NHS England core script for spirometry below (p. 24) which is designed to help address these issues.

Chapter Two: Overcoming Challenges to Delivery of Diagnostic Testing

Why aren't diagnostic tests such as spirometry being performed universally across primary care at the moment?

Progress towards the restart of spirometry following the COVID-19 pandemic has been variable nationwide. The key barriers to the provision of these crucial diagnostic tests are:

1. **Workforce**
2. **Equipment**
3. **Training and accreditation**
4. **Estates, spaces and infection prevention and control**
5. **Lack of funding for spirometry.**

This chapter will go through these in detail, with case studies exploring potential solutions.
We aim to demonstrate how these barriers can be overcome, and to outline how Integrated Care Systems (ICSs) can best provide respiratory diagnostic capacity.

In 2022, NHS England worked with respiratory clinical networks to produce a "**core script**" for spirometry in the community, a narrative for networks to use and adapt to their local area to help them restart quality-assured spirometry.[72] Key considerations to inform the restart of spirometry outlined in the script include:

- **Spirometry can be performed safely for patients and staff**, as it is not an aerosol generating procedure (AGP).[73]
- **Support is available to deliver high quality spirometry**, as defined by the quality standards set and assessed by the Association for Respiratory Technology & Physiology (ARTP).
- **Find the right model of delivery for your area.** This may be at practice, Primary Care Network (PCN) or place-based level, potentially including Community Diagnostic Centres (CDCs), depending on local circumstances.
- **Respiratory clinical networks are available for advice and support.**[74]

Although these are the factors that can make implementing this guidance difficult for ICSs, you can find details of your local respiratory network for additional support on **Future NHS**,[75] subject to permission to share contact details.

Case study one:

London Respiratory Clinical Network and North West London Respiratory Diagnostic Hub: an opportunity to do spirometry differently.

The London Respiratory Clinical Network (LRCN) have developed a service specification which aims to outline an integrated pathway for diagnostic testing referrals between general practice, respiratory diagnostic hubs (RDHs), and Community Diagnostic Centres. This aims to provide clinical oversight to support interpretation of spirometry where needed.

The vision is for respiratory diagnostic hubs to be set up in line with primary care networks (PCNs) – for a footprint of around 40,000–50,000 people.

Challenges: the lack of national funding for spirometry, as opposed to that for CDCs, is challenging.

Solutions: ICSs need to use spirometry training funding where possible and LRCN is encouraging them to develop RDHs and providing support with business cases and data where needed. They hope to support ICSs to develop a system-led plan to roll out RDHs in their area, with at least one hub per borough. Some ICBs have included hub spirometry funding within their PCN contract (as an option).

The London Respiratory Clinical Network have used challenges surrounding restarting spirometry after the pandemic as an opportunity.

For a long time, they had wanted to take spirometry out of routine activity, to ensure a consistent and quality-assured approach in primary care in the community.

Approach: scale delivery to a standardised level is better. They mapped provision against deprivation and considered proximity to CDCs to ensure good coverage.

Data collection is underway to capture provision of spirometry in primary care during and since the pandemic, to find out what is happening to spirometry volumes.

Although progress across London's five ICSs is varied, North West London is most advanced and now has one RDH per borough, and is collecting data on referrals, tests conducted and diagnoses to inform service improvement.

North Central is also funding RDHs.

For further information and to contact the London team with any queries, please email **policy@asthmaandlung.org.uk**

This chapter also explores other opportunities to improve diagnostic testing provision:

6. The role of Community Diagnostic Centres (CDCs)
7. Targeted Lung Health Checks (TLHCs)
8. Diagnosis for children and young people (CYP)
9. Future developments in diagnostics.

1. Workforce issues

A survey by the Taskforce for Lung Health in November 2022 found that:

> Availability or capacity of staff was reported by 79% of respondents as at least a minor barrier to spirometry. Over a third, 36%, reported it as a significant barrier. The availability of adequate training for staff, and difficulties getting staff accredited, had 70% and 68% reporting these as at least minor barriers, respectively.
>
> Infection prevention or control was also at least a minor barrier for 70%.[76]
>
> Staff capacity overall was highlighted as one of the main issues, which we asked about in more detail. Around 3 out of 5, 62%, reported that staff capacity to perform the test was an issue, and 56% reported that staff capacity for training was an issue. Training in general was also reported as a problem for many.[77]

The workforce that people with lung conditions depend on is much broader than is often recognised. Good respiratory care relies on a large multidisciplinary team, including GPs, physiotherapists, and pharmacists, so shortages in the wider NHS workforce also present significant obstacles to good quality respiratory care.

The COVID-19 pandemic exacerbated pre-existing challenges in respiratory care, due to additional pressure on the workforce. Greater capacity and planning are also needed to help meet winter pressures. Significant problems in respiratory care will worsen unless there are sufficient staff in the NHS with the right skills to meet patients' needs.

Some practices may have issues with staff capacity and training to deliver crucial diagnostic tests, or with indemnity. It is essential that ICBs assess local demand and plan how to meet this.

In 2021, 82% of hospitals surveyed by the British Thoracic Society (BTS) reported vacant respiratory consultant posts.[78] Almost half (48.1%) of nurses surveyed in 2016 by the Association of Respiratory Nurse Specialists (ARNS) planned to retire or would be eligible for retirement by 2026.[79]

However, there are innovative workforce solutions such as different models for the delivery and interpretation of key tests like spirometry, respiratory nurse-led clinics (see case study three, pp. 27-28), the use of healthcare assistants, healthcare scientists, respiratory physiologists, Healthcare Science Apprenticeships (see case study two, p. 27 below),[80] physician associates (encouraged through the PCN Directed Enhanced Service (DES)), and multi-disciplinary team working with pharmacists, both within the community and in general practice itself. The new Department of Health and Social Care "**Delivery plan for recovering access to primary care**" considers the role of pharmacy in increasing patient access to primary care services and may offer an opportunity for increased spirometry provision.[81] Our case studies also demonstrate different potential workforce models which may suit your local area.

Case study two:

Use of Healthcare Science Apprentices[82]

NHS England are piloting Level 2 and Level 4 Cardiorespiratory apprentices working with the National School of Healthcare Science and Health Education England.

Funding has been provided for over 400 apprentices with financial support for the first year for Level 2 and Level 4 resources.

Further information is available **here**.[83]

Some areas may use a lower-band (3/4) member of staff (possibly through the Additional Roles Reimbursement Scheme (ARRS)) who is trained to deliver the tests and a higher-band (6/7) colleague for interpretation or reporting, with or without the assistance of artificial intelligence (AI, discussed below). This may help make the best use of limited resources.

Case study three:

Ioulia (Julie) Mariaki, Dr S. Mittal, Paula Batson, Julienne Stewart: Spirometry Restart Service in General Practice.

Role: Community Respiratory Nurse

Where: Open Door Surgery, Balham, Wandsworth PCN, South West London. A small practice focused on management of long-term conditions.

Location: during COVID-19 (after guidance to restart the spirometry service given): lung function testing in the garden.

Now: inside the clinic with open windows and towards an open outside door (patients sit in front of an open door).

Service: Spirometry diagnostic testing, Saturday morning clinic. Managing respiratory patients at surgery level when there is more space and flexibility than during the week.

Julie says:

"We are reviewing all our respiratory patients with:

- Full history taking and physical examination
- FeNO testing
- Peak flow diary
- We offer baseline, post bronchodilator and reversible spirometry (depending on the need and the suggested history)
- Initiating treatment, titrating existing medication
- Self-management plan including rescue packs
- Referral for pulmonary rehabilitation and further investigation/review (if needed) by a respiratory consultant."

Workforce: as an ARTP accredited practitioner, Julie runs the clinic with the assistance of a Healthcare Assistant to perform the lung function tests. A respiratory physician from the local hospital has now agreed to support the clinic to discuss complex patients and assist with audit.

Support: Cases can be discussed with the senior GP (Dr S. Mittal) and complex patients are referred to secondary care for further investigation.

Challenges: Some patients do not attend when invited but the practice is managing this by sending text reminders. Some patient education is needed around inhaler switching and optimising medication use where appropriate. The practice manages infection control (as per suggested protocol from the London Respiratory Network, national and local guidelines) with appropriate ventilation and disposable equipment.

Julie says: "Where there is a will there is a way. The service is working really well, and if it can work for us in our small practice, it could work anywhere. We are very keen to share good practice and are happy to be contacted to share advice on running nurse-led clinics to manage respiratory patients in this way."

For further information and to contact the Balham team with any queries, please email **policy@asthmaandlung.org.uk**

We know that people with a lung condition often fail to receive a timely diagnosis, and action to develop the workforce to meet local needs at ICS level could help to address this at a local level.

Unlike cardiology or cancer, people with respiratory conditions struggle to see a respiratory consultant when admitted to hospital with an exacerbation, and patients often tell us that their general practitioner doesn't have relevant knowledge of their respiratory condition.

The importance of workforce planning

Workforce planning is needed to enable diagnostic testing provision. Demand needs to be balanced with timely delivery. To this end the team at Queen Victoria Hospital NHS Foundation Trust in Sussex (described in case study seven, pp. 50-51 below) started with a small number of practices and are expanding in a controlled way.

ICB plans being drafted in spring 2023 should also consider workforce needs for their areas, as well as planned activity, finance and transformation goals needed to meet their objectives.[84]

Developing a diagnostic testing service requires existing staff to take on an additional workload, which can be balanced by providing training and the opportunity to develop new skills.

Additional recruitment may also be required, and this may be complicated without sufficient or long-term funding in place to facilitate this. See the Sussex case study seven, pp. 50-51 below for further discussion of these issues.

Although the development of NHS England's **Long Term Workforce Plan**[2] represents an opportunity to finally give the respiratory workforce the greater recognition it deserves, action is needed at an ICB level now to safeguard much-needed capacity for the next five years.

[2] Published **here** in June 2023 as this report was finalised.

Policy recommendations

For ICBs/ICSs:

- ICBs should have a clear and strategic view of current and future demand on their service and should plan to adequately meet this demand for their population, ensuring that there is an appropriately qualified workforce in place.
- Current practice shows that a number of workforce models are being implemented successfully. ICBs should identify which model will suit their area best.
- Innovative workforce integration between primary and secondary care: we are also calling on secondary care consultants to widen access to virtual appointments where appropriate and to hold face-to-face clinics in the community to ensure people can access the best care regardless of protected characteristics, such as disability, where they live or their socioeconomic status. All these factors can prevent people from having the time, money, or ability to travel significant distances for specialist consultation.

For NHS England:

- Develop a model for rapid access to respiratory specialists in the event of an exacerbation, which can include specialist allied health professionals. This will not only result in better patient experience and outcomes but will reduce system bottlenecks currently being experienced in the emergency department, acute bed capacity and discharge.
- Develop standardised respiratory training for the healthcare workforce, including medical students and pharmacists.

2. Equipment issues

Although spirometers are relatively widespread in primary care, accessing equipment can present a greater challenge for FeNO testing. Although **NICE guidelines**[85] recommend FeNO testing, FeNO is optional within the Quality and Outcomes Framework (QOF), named as one of three objective tests, where one must be used.[86] This may be because FeNO testing equipment is not widely enough available, and as such funding and implementation within primary care is less likely, especially when practices have struggled to restart spirometry.

Data from the NHS England Accelerated Access Collaborative (AAC) and AHSN Network national FeNO implementation programme[87] supported over 1,200 FeNO devices to enter primary care between April 2021 and March 2023 as a direct outcome of the programme. As a result, the AHSN Network estimates that at the end of the programme, 53% of PCNs have access to a FeNO test.

The AHSN Network's national work on FeNO testing, outlined below, shows that it was possible to improve uptake of FeNO in primary care in England during the COVID-19 pandemic. Some equipment was funded directly by the AAC programme, but most equipment was bought directly by practices, Primary Care Networks (PCNs) and Integrated Care Boards (ICBs). The AHSN Network's approach to supporting FeNO adoption at scale was built around the need to focus on the pathway, large scale transformation and learning, and the impact FeNO testing has, rather than solely on the device. This approach can be replicated elsewhere to spread good practice further.

Policy recommendation

- ICBs should use available operational plans for training, keep equipment up to date and plan for associated costs.

3. Training and accreditation issues

Spirometry
Spirometry certification is not mandatory but proves that a provider has met the national standard for good quality-assured spirometry. Registration is recommended to ensure good professional practice and quality-assured spirometry. Information on the number of accredited professionals within each ICB area is now being used by NHS England as a quarterly reporting metric.

The Association for Respiratory Technology & Physiology **(ARTP)** is the sole provider of spirometry certification and assessment.[88] They also keep the register of those with ARTP certification. ARTP does not provide training in spirometry, but it does hold a directory of training providers, available on the ARTP website.[89]

Accreditation is acquired through the ARTP spirometry certification route. There are three levels depending on the candidate's experience, exposure and intended outcome. Once the candidate has successfully completed the certification process, they will automatically be added to the national spirometry register, unless they request not to be included.

It is the candidate's responsibility to renew their registration each year to remain on the national spirometry register. Full information regarding the certification process is available on the ARTP website.[90]

Over the pandemic, the certification of many accredited practitioners lapsed. To manage and improve the certification process, ARTP made changes including a mentor programme and increasing the time allowed to complete the multiple-choice questionnaire (MCQ). ARTP also provides guides and reference material to help candidates and assessors prepare.

ARTP is aiming for an increased number of healthcare professionals performing community spirometry and to continue to improve the diagnosis and management of lung conditions in the community.

How might spirometry certification be improved?
We have heard that it can be challenging to ensure practices have staff that have ARTP certification when there is no funding to support this.

In addition, as ARTP registration is not mandatory, it be may difficult for staff to identify training that that is suitable to achieve ARTP accreditation. However, a list of suggested trainers is available on the ARTP website.

Support from practices is needed to allow ARTP accredited staff to run spirometry clinics.

Solutions are required to address issues like these. NHS England provided £1.3 million funding to respiratory clinical networks for 2022–23 to support the training and certification of staff; however, a sustainable and ongoing solution will be required for 2023–24 onwards.

We are aware that NHS England is developing a working group focused on early and accurate diagnosis to address challenges with spirometry, including accreditation. For instance, we are aware that reaccreditation fees can pose a barrier for registrants, in top of other professional registration fees, such as those for their Royal College, union or regulator, especially if practices are unable to contribute to these fees. This group aims to increase confidence in the ARTP process.

We hope to see data published quarterly to map registrants and monitor progress.
Although there have been barriers to delivering spirometry historically which have been exacerbated by the pandemic, none of these are insurmountable, as our case studies throughout this report show. There are varied models for the delivery of spirometry to suit differing local contexts. What is important is that spirometry is accessible to those that need it.

What is needed now is support for staff to (re)complete certification and maintain their registration. This will require time and funding for preparatory training and to enable staff to develop their portfolio. It is important for ICBs to note that sending staff on a spirometry training course is not sufficient, as ongoing support and supervision is required to enable quality-assured diagnostic testing provision in practice. As well as maintaining skills through performing and interpreting a reasonable volume of tests, supervision for troubleshooting can be helpful to enable practitioners to develop their practice and competence. We recommend the use of Respiratory Champions for this purpose (see Gloucestershire case study six, pp. 39-40 below, for further information).

FeNO testing
FeNO testing can be used for adults and children over 5 years. No accreditation is needed to undertake FeNO testing, however there is a training package on the Health Education England (HEE) platform which is recommended before starting to do FeNO.[91,92]

What is important for patients is to know that the staff conducting and interpreting their diagnostic tests are competent, to ensure the quality of tests and results.

Case study four:

Wessex Academic Health Science Network (AHSN) and AHSN Network: spreading innovation for the diagnosis and management of asthma

Programme description: Implementation of FeNO testing at scale across England was commissioned by the **NHS England Accelerated Access Collaborative** (AAC)[93] and delivered by the **AHSN Network**[94] from April 2021 to March 2023. The programme set an ambition to improve asthma diagnosis and management through the sustainable implementation and integration of FeNO testing into primary care asthma pathways.

Where: Wessex AHSN was the national AHSN lead for the programme, providing strategic leadership to all 15 AHSNs, which delivered the programme locally in partnership with their local health systems – comprising clinical networks, GP practices, Primary Care Networks (PCNs) and Integrated Care Boards (ICBs).

Service: To support delivery, Wessex AHSN created a bespoke a FeNO deployment **toolkit**,[95] including a wide range of resources (including training, patient leaflets, project plans, videos, podcasts, standard operating procedures (SOPs) etc) and built a support network to enable FeNO use within frontline clinical teams through their **National FeNO Learning Collaborative**.[96] The 15 AHSNs used the nationally created resources to support their adoption and spread activity, tailoring their approach to meet the needs of local health systems and services.

Education Toolkit: The FeNO toolkit created resources under three broad headings:

- Overview of the two NICE recommended FeNO products.
- Clinical resources to support care delivery – such as infection control guidance, Standard Operation Procedures, or patient information leaflets.

- Wider change management – such as draft project plans, action learning set templates, business case templates, implementation checklists.

National impact: The programme has:

- Supported the correct diagnosis of 58,000 new asthmatics, more accurately and faster, enabling them to commence appropriate treatment sooner.
- Implemented in excess of 1,200 FeNO devices in primary care, enabling 53% of PCNs to have access to FeNO testing in England.
- Built two FeNO training modules, hosted by Health Education England, which have supported 4,900 hours of training to date.
- Supported and funded (by the Office for Life Sciences) 33 national FeNO transformation projects across England, with a value of £915,000.
- Received 13,500 views of its implementation toolkit.
- Stimulated the national FeNO market – growing total market value and helping to drive down costs.

Challenges: Delivering any large-scale transformation programme is not straightforward. One of the programme's significant challenges was to deliver a respiratory change programme during the COVID-19 pandemic, and the subsequent competing demands on time in primary care. For programmes like this, it takes time to raise awareness and build will in key ICB and PCN stakeholders before machine implementation and associated pathway improvement work can begin.

Key success factors: The programme identified nine key success factors. You can read the wider national FeNO programme closure report **here**.[97]

- Take a **pathway approach** to transformation, focusing on adopters
- Allow for **local adaptability** and local focus in the context of a wider ambition
- **Partnerships and collaboration** are essential
- The **right people are essential** – including engaged patients with lived experience and capable clinical leaders. The patient participation/co-production element built into the project design was a critical part of the success and impact
- **Networked leadership**, built on local knowledge
- Underpin the programme with **sound theory, planning and processes**
- **Appetite** and **ambition**
- **Clear vision and priorities** that align with national, local, and individual ambitions and drivers
- A cohesive, diverse, and **empowered steering group**.

Policy recommendation

- ICBs should prioritise delivery of training to ensure their respiratory workforce are able to perform/ interpret spirometry results with appropriate certification.

4. Estates, spaces and infection prevention and control

During the pandemic there was uncertainty around whether tests like spirometry were an aerosol generating procedure (AGP), which led to services being paused. However, clear guidance now states that it is safe to restart spirometry, and there is an urgent need to restore universal access to quality-assured spirometry for all who need it.[98]

Estates and appropriate spaces to perform diagnostic tests with recommended levels of infection control can also be a barrier for some practices. However, it is now time to move forward from infection prevention and control (IPC) concerns being a prohibitive factor, as a pre-pandemic approach to IPC is now appropriate.

Recently published evidence confirmed that spirometry is not an aerosol generating procedure (AGP), and as such can be performed safely for both patients and staff. Spirometry is not on the UK Aerosol Generating Procedures (AGP) list[99] and the most recent rapid review of aerosol generating procedures in June 2022 concluded that it should it remain excluded from the list.[100] This is supported by the latest Primary Care Respiratory Society (PCRS)[101] and **ARTP guidance**.[102]

Any risk is with an associated cough (in 50% of patients' cases), and simple mitigating strategies (using filters or a mask) are effective in reducing risk. Risk level depends on the number of air changes per hour. During spirometry, patients are breathing into a bacterial viral filter, which is lower risk than in the waiting room. Using appropriate ventilation where possible is recommended, as well as standard cleaning procedures and managing the risk of cough appropriately. The use of bacterial filters is recommended. Although a little more costly, they offer a high degree of protection for operators and patients.

Unless it is possible to use fallow times, managing COVID-19 as endemic is now recommended, as with any other respiratory infections in winter. This means general IPC guidance should apply, in accordance with recent updates by the UK Health Security Agency (UKHSA).[103] Your local IPC team should be able to advise further.

Where clinical space is a challenge, weekend clinics like the one described above in case study three, pp. 27-28 can help to address this, as spirometry clinics can be arranged when there is less competition for clinical space.

Another solution is travelling diagnostic vans.

Case study five:

Community diagnostics van by PROVIDE Community Interest Company (CIC), Mid and South Essex.

Name and Role: Alex Lambert, Nurse, Mid and South Essex Community Collaborative; Karen Cox, Long Covid Project Manager.

Service: A van that travels around Mid and South Essex to provide diagnostic services to lesser heard-from communities.

A COVID-19 vaccination van has been reutilised as a respiratory diagnostics van. Tests that can be

conducted in the van include spirometry, blood pressure, six-lead ECGs, and pulse oximetry. The service also gives advice for patients with symptoms suggesting Long COVID-19, signposting them to the Long COVID service. Both pre-booked and drop-in appointments are available.
The service aims to reduce waiting lists and thus the burden on the local healthcare system by offering timelier spirometry closer to home, especially for those identified within the **Core20PLUS5**[104] target population. Patients can also be referred to additional relevant healthcare services after attending a clinic with Alex, which has resulted in lives being saved.

Alex says:

"It's great to go out to places where people feel more comfortable to come and talk to me about health issues, when they wouldn't go and see their GP or the nurse, but they might want to have a little chat. And then I can signpost them."

Workforce: Alex, a qualified nurse, travels around with a van driver. Occasionally she is joined by nurses, physiotherapists, and occupational therapists who offer supplementary services. Their service is also supported by the county council who help them access seldom heard-from communities.

Challenges:

- It can be quite time consuming to find places that are happy to receive the service, and some, such as Traveller community sites, can be quite difficult to access.
- Because the van is donated by Ford, they have stipulations about who drives it and where it's stored.
- The van was designed for vaccinations, so the design and space inside could be better designed for diagnostics. This would make the service easier to provide in bad weather conditions.

Karen says:

"Offering that one-stop service: blood pressure, hypertension management, and spirometry screening is needed for efficiencies. Because standalone diagnostic services, patients going from one unit to another, just isn't feasible given the cost of living and transport for many of our patients. We are bringing these services to people who may not otherwise access them."

Solutions like these can help to tackle inequalities by enabling services to reach lesser heard-from groups who may find it hard to travel to a clinic at a practice site.

Policy recommendation

- Read the latest guidance on managing the risk of respiratory infection as endemic and ensure universal access to quality-assured spirometry for all that need it.

5. Lack of funding for spirometry

Most importantly, the lack of funding stream for spirometry and FeNO testing, as these are not included within the GP contract, causes many problems. As a result, alternative sources of funding must be found to enable the delivery of an effective service for the benefit of patients, something which is increasingly problematic in the current economic climate. This is the reason why some areas, such as Gloucestershire (outlined below/case study six, pp. 39-40) have needed to fund diagnostic testing services locally.

While the provision of training funds by NHS England to ensure that staff can perform quality-assured spirometry is welcome, the lack of a payment structure for spirometry is a much stronger barrier which needs to be addressed. Where areas do not feel able to perform adequate spirometry testing because of a lack of funding, funding to train staff for a service which is not being delivered does not seem helpful.

As discussed above, we are aware that tariffs for tests can vary greatly between national and local level. Some tests may be available for a much cheaper cost-per-head in primary care than they may be in a Community Diagnostic Centre (CDC). It is likely to be more cost effective to delivery spirometry services at a practice or PCN level than considering outsourcing this by referring patients elsewhere, even if this remains within primary care, such as a CDC.

Case study six:

Carol Stonham MBE: Delivering a respiratory diagnostics Local Enhanced Service (LES) in Gloucestershire to fund and incentivise spirometry

Role: Respiratory nurse, NHS Gloucestershire Integrated Care Board (ICB), NHS England South West Respiratory Network Clinical Co-Lead.

Pandemic challenges: Spirometry was contentious before COVID-19 nationally. Most activity had been paused in the early phase of the pandemic. Competing priorities in primary care stalled restarting activity. There was also very little availability of FeNO testing, and a backlog of patients requiring a confirmed diagnosis of asthma or COPD.

Participation in the Accelerated Access Collaborative (AAC) FeNO project successfully provided funding in one locality, Stroud and Berkeley Vale (19 practices).

Aims of FeNO project:

- Re-establish primary care-based direct referral FeNO testing. Patients to be seen by a specialist nurse.
- Training to provide FeNO testing and rolling out FeNO at practice level.
- Access to secondary care virtual multidisciplinary team meeting (MDT) for primary care practitioners to discuss complex patients.

Results:

- Following training at hospital-based clinics, 17/19 GP practices are now offering FeNO testing.
- Community of Practice and MDTs established.
- Hundreds of patients reviewed and given asthma diagnosis following FeNO.

This acted as a springboard for county-wide roll-out via a respiratory LES.

Considerations: Cost of testing: equipment supply and service, consumables, servicing, and training. Allowed the **reintroduction of spirometry, driven by PCN Respiratory Champions.**

Key features of the NHS Gloucestershire approach:

- Respiratory diagnostics local enhanced service (LES)
- Supply FeNO and consumables
- Payment for diagnostic spirometry and FeNO testing
- Targeted spirometry training
- Encourage PCN working
- Funded respiratory champions 1 day/week per PCN.

Carol says: "to summarise what is included in our spirometry and FeNO contract elements of the service specification:

- The cost of consumables, as well as administrative time, staff backfill and overheads of delivering clinics are included in our cost per case of performing each test.
- We also appreciated that some practices may not have qualified staff to perform the spirometry and FeNO testing, so we have included in our contract funds to support practice clinicians to undertake spirometry training, as well as providing online training for FeNO testing and educational webinars with Gloucestershire & South West Respiratory Clinical Network colleagues.
- We purchased FeNO device for all practices that signed up to the enhanced service, unless they opted out of the FeNO contract element.
- We also engaged practice respiratory clinicians through peer support and specialist advice from our PCN respiratory champions, secondary and community care respiratory specialists, as well as our Respiratory clinical programme leads via workshops, direct communications, and messaging forums."

Further information is available **here**.[105]

ICBs now have greater local flexibility to determine where and how to spend funding which has been allocated centrally. Potential adverse consequences should be considered if balancing the budget takes priority over investment in clinical services, particularly where key primary care diagnostic services, such as spirometry and FeNO testing, may be particularly under pressure. We expect to see support from NHS England to ensure funding is used for its intended purpose and additional funding to become available from the central budget to support restart of services and spirometry training at a regional level in 2023–24. However, it is important to note that funding training in isolation without the required workforce, equipment, or incentive to perform the test itself is not sufficient.

Savings caused by commissioning these services locally could benefit both individual practices and the wider system as a whole, including reducing pressure on secondary care and unplanned hospital admissions, e.g., in Urgent and Emergency care.

Without action, the current funding arrangements actively disincentivise integrated care. We expect to see funding solutions to this, such as a funding stream for spirometry and FeNO testing, or at least a unified tariff between primary and secondary care (including CDCs) to avoid unwarranted variation in the amount of funding required to deliver diagnostic tests in different settings.

As areas are starting to commission spirometry (either from practices, from the community or from CDCs or PCNs) to deliver diagnostic testing, this needs to be funded adequately, including:

a) staff time and training

b) equipment and consumables

c) administration and venue costs.

This varies depending on environment but could be explicitly calculated comfortably to be fair in all areas of the system.

Policy recommendations

For ICBs/ ICSs:

- ICBs should acknowledge the importance of spirometry for their local population, given the benefits outlined above in Chapter One.
- Recognise ***all*** costs involved for any provider who wants to provide respiratory tests (such as workforce, access to training for skills development, certification and maintaining registrations, equipment – machines, consumables, and software, as well as test delivery and interpretation).
- Develop local payment mechanisms to ensure no one is disadvantaged by setting up a service to meet local needs. Ensure that all patients have access to these tests with appropriate governance around the quality of provision and interpretation.

Funding should be made available via GP or PCN contracts, or any other mechanisms that can encourage equitable access for patients.

For NHS England:

- Clarity on the funding and provision of diagnostic tests is urgently required, whether in primary care, Community Diagnostic Centres or secondary care, with an aim of increasing access, ideally in primary care.
- Specific funding is needed to improve spirometry training at primary care level.
- Providers also need scope to use funding allocated for spirometry training more broadly to cover cost of overheads, as described in the Gloucestershire case study six, pp. 39-40 above.
- Likewise, now that allocation of funding for pulmonary rehabilitation is linked to long term conditions, it cannot be used elsewhere in respiratory care where it is urgently needed, such as the funding of spirometry and FeNO testing. Greater flexibility for ICBs to allocate funding where it is most needed would be much more useful than any national oversight to monitor appropriate spending of funds retrospectively.
- Consider encouraging the replication of the Gloucestershire LES model elsewhere or developing it as a national programme.
- Spirometry should be incentivised as a paid-for diagnostic test within the GP contract.
- In the longer term, NHS England should develop a standardised national or guide tariff for diagnostic testing for different settings, in the same way as echocardiograms, where there is a national tariff embedded in the imaging unbundled tariffs.

6. The role of Community Diagnostic Centres (CDCs)

This section aims to address what impacts, both positive and negative, CDCs might have for respiratory diagnostics.

The creation of Community Diagnostic Centres was recommended following Professor Sir Mike Richards' review of NHS diagnostics capacity.[106]

There are three models or archetypes for CDC facilities: standard, large and hub and spoke.

- Standard CDCs provide minimum diagnostic tests, which include respiratory tests (including sleep studies).
- Large CDCs offer additional services and any other diagnostic testing that is required in the local system. They also provide more scalable testing, with multiple equipment/rooms for greater efficiency.
- Hub and spoke: the hub must include all minimum diagnostic testing like a standard model CDC. Spokes are designed to give flexibility to meet local needs, in addition to those tests provided at the local standard or large CDC. A spoke must have one core diagnostic testing imaging modality, plus at least two others from the CDC test list. One of these tests could be spirometry.

All ICSs should have at least one standard, hub, or large CDC site in their area.

The purpose and role of Community Diagnostic Centres (CDCS)

Further work is needed to clarify the role and contribution of CDCs in primary care. CDCs were designed as "one-stop shops" for diagnostic scans, tests, and checks.[107] They were intended to allow patients to access planned diagnostic care closer to home, without the need to attend acute hospital sites. Shorter waiting times and reduced risk of cancellation aimed to improve patient experience and outcomes by facilitating earlier and more accurate diagnosis.[108]

Other key ambitions for the CDC programme include:

- Increasing capacity via new facilities, equipment, and training new staff. This will help pandemic recovery and reduce pressure on acute services.
- Improving productivity and efficiency to streamline diagnostic services by redesigning pathways where needed.
- Reducing health inequalities by giving everyone the same access to care.
- A more personalised experience and more joined-up care.[109]

However, CDCs are not designed to replace current primary care provision. Rather, CDCs are better seen as part of the solution. CDCs were always intended to add capacity, not replace it from primary care. CDCs cannot be the only solution because the volume required is beyond the added capacity that they can provide. In addition, patients requiring spirometry may not need all the range of tests a CDC can provide, so this may not be the best location to deliver spirometry in a local area. There is no single solution: local solutions should suit the population best.

Primary care needs to continue diagnostic testing, such as such spirometry and FeNO, as this cannot all be commissioned through CDCs, for the reasons outlined above. However, this cannot happen without proper funding, and we recognise that these tests are not funded at all for primary care to perform.

In light of current demands and new access targets in the GP contract for 2023–24, many areas, with the support of their local medical committee (LMC), may elect to refer to a commissioned service, such as a CDC or secondary care. NHS England need to fund primary care to provide some of these diagnostic tests or to ensure CDCs have sufficient capacity to perform these tests on their behalf.

We recognise that general practice, like hospitals and commissioned services, cannot take on additional workload without adequate resource, especially with extreme workforce and demand issues.

However, action is still needed elsewhere in primary care and services should not rely on CDCs to meet diagnostic demand in their area. For example, as more GPs refer patients to CDCs for diagnostic tests such as spirometry, a reporting solution will need to be found within primary care to help interpret the additional test results. Even where this is challenging, objective tests should be used where possible, as clinical diagnosis or treatment is best informed by the confirmation that testing can provide. We also expect to see NHS England do more to develop GP Direct Access for conditions like COPD and asthma, and to encourage local areas to use these services where they are available.

The roll-out of the CDC programme as more centres are approved and open is promising as this can boost overall diagnostic capacity and improve the patient journey, by allowing people to access testing closer to home in one convenient visit.

According to NHS England, spirometry and FeNO testing should be available in all standard and large CDCs, plus hubs (but not necessarily spokes). We would like to see key diagnostic tests such as spirometry and FeNO testing available at all community diagnostic hubs, regardless of size or classification.

Further information is needed on capacity versus demand in CDCs and elsewhere in primary care, as referrals to the new sites get up to speed. Additional capacity for new cases of suspected asthma and COPD will be required. We would like to see data published on the number of tests conducted, and how many CDCs are doing tests like spirometry, compared to other tests like endoscopy. Support from NHS England is required to understand the reasons for CDCs providing low levels of respiratory tests and plan how this can be improved.

There will be a need to build credibility in CDCs in community settings so that people understand that they remain part of the NHS, even if they are located in a place like a shopping centre. This is a communication need of people referred to CDCs that NHS England will need to address as the programme is rolled out wider.

The King's Fund highlight that although CDCs are designed to be in the community, many of the earlier sites are still located on NHS trust sites or otherwise linked to hospital or other existing care settings.[110] This may limit their ability to tackle health inequalities, as they may need to work harder to gain trust amongst some communities who may be less likely to engage with the health system, due to negative past experiences.[111] In this respect, the King's Fund suggest that the CDC programme should learn lessons from the pandemic, where vaccines were widely available in community settings, such as temples and churches.[112]

Some CDCs could still be a considerable round trip for some patients, particularly in rural areas. CDCs need to be accessible for all communities.

There is a clear need for patient-facing communications, education, and support so that people with lung conditions can understand the process of being referred to a CDC and what to expect about this new kind of patient journey. Some patients may be reluctant to travel for diagnostic testing, especially if they have already commenced treatment without prior objective testing.

To meet this need, Asthma + Lung UK has worked with NHS England to run patient focus groups to help inform communications about CDCs for people with lung conditions.

Policy recommendations

For ICBs/ ICSs:

- ICBs should take the role of CDCs carefully into account, ensuring integrated provision across primary care.
- We ask your ICS to restart quality-assured spirometry in primary care in full by the end of the 2023/24 financial year, and to ensure that these tests are available at all community diagnostic hubs, regardless of size or classification.

For NHS England:

- Provide clear guidance that CDCs are intended to boost diagnostic capacity alongside provision in primary care and are unlikely to be able to deliver all respiratory diagnostic testing, even when fully up and running.

7. Targeted Lung Health Checks (TLHCs)

Targeted Lung Health Checks (TLHCs) are a national screening programme for those aged 55–75 with a smoking history who are at high risk of lung cancer.[113] NHS England funds Cancer Alliances, via ICBs, to run the programme. We believe the TLHC programme has the potential to deliver considerable benefits beyond the diagnosis of lung cancer alone, particularly to improve the accurate diagnosis and management of a wider range of lung conditions, improve patient outcomes and reduce demand on the NHS.[114]

Diagnostic benefits beyond lung cancer

To maximise both the effectiveness and cost effectiveness of TLHCs, efforts should be made to identify and diagnose other lung conditions, allowing for treatment to improve symptoms and reduce the risk of acute events. Incidental findings such as COPD, pulmonary fibrosis, and bronchiectasis[115] are more frequent than lung cancer diagnoses[116] within the target population.

This will also be important to meet patients' expectations from a lung health check. Although it is named accordingly to encourage uptake and reduce fears associated with cancer screening, a test described as a lung health check which looks for cancer, but does not consider other conditions, may give patients misleading results or false reassurance. This is particularly relevant due to the risk factors for other conditions, such as those mentioned above, within the age group of the target population. Moreover, where people attending TLHC report symptoms of breathlessness and/or cough, spirometry becomes a diagnostic test, not a screening procedure. Ignoring these symptoms in this population is clinically negligent.

Spirometry testing is essential for the diagnosis of COPD and pulmonary fibrosis.[117] Spirometry was included as a mandatory test in the original TLHC protocol, but because of a change in practice due to the COVID-19 outbreak, existing Lung Health Check sites have not had to deliver spirometry since March 2020. Given it is now considered safe to conduct spirometry,[118] we are disappointed that there are no plans to restore it as a mandated part of TLHCs.

Research is now being commissioned by the National Institute for Health and Care Research (NIHR) into the effectiveness of screening for COPD via spirometry testing, including the mechanisms which will drive adherence to protocols by GPs and patients. Once this research is available, NHS and government must act on its findings.

Eventually, we would like to see the integration of TLHCs into breathlessness pathways, including spirometry and symptom screening tools.

Policy recommendation

- People presenting to TLHCs with respiratory symptoms should have spirometry performed, as per the recommendation in the national protocol for TLHCs (3.2.5).[2] This is a diagnostic test, not screening.

[3]3.2.5: "It is recommended that participants assessed as being at high risk of lung cancer should have add-on investigations including spirometry and blood pressure measurement."
The national TLHC team funds ongoing spirometry training with ARTP accreditation for sites that want to run it.

8. Diagnosis for children and young people (CYP)

Given how common lung conditions like asthma are in childhood,[119] action is needed to address inequity around children's diagnostics. Although spirometry and FeNO testing are recommended in guidelines for children over age five,[120] most asthma diagnosis (and therefore misdiagnosis) happens in childhood. This is because children are receiving inhalers without any diagnostic tests being done, as many children are unable to do the diagnostic tests, even when these are available. This is why it's important to consider the use of alternative tests for younger patients, or anyone who may struggle to complete usual tests (discussed in more detail below), and the use of coding to identify those with suspected lung conditions whilst they are waiting for this to be confirmed with objective testing.

The main barrier to testing is lack of funding. However, enforcing the need to increase access to diagnostic testing could become a barrier to treatment if a resolution to the lack of financial resource is not found.

A lack of training is also an issue, as many clinicians with ARTP spirometry certification for adults cannot perform or interpret tests results in children. There are also safeguarding considerations in paediatrics. Ideally training and assessment for testing both adults and children should be combined, so that registrants can demonstrate their competency in both together, and testing for children is not seen as an optional extra. Although different skills are needed to perform and interpret spirometry for adults and children, training in testing children is available and should be included in any training delivered for efficiency. It's important to identify the cohort for your service and link in with Children and Young People (CYP) networks to get the right framework in place.

NHS England's emphasis on secondary prevention discussed above includes the prioritisation of personalised asthma action plans for all children and young people with asthma.[121] This further supports the aim to address inequalities in the focus on asthma for children and young people in the 'CORE20PLUS5' initiative, which identifies addressing overreliance on reliever medications and decreasing the number of asthma attacks as a key goal.[122]

As discussed above, children and young people should also be at the forefront of considerations of CDC service delivery: if there is no capacity for paediatric testing then where will this be done?

Building in the governance, including capacity, capabilities, and pathways to deliver this is worth investing in now to prepare well for the future. It shouldn't be forgotten that children become adults, and years of harm caused by inappropriate medications could cost more to the NHS in the long term. We need to break down the barriers between adult and paediatric diagnostic provision: planning diagnostic services should not consider adults in isolation or separately to children and young people. Staff need to have training and experience in treating people of any age with lung conditions.

Policy recommendations

- Recommendations on early and accurate diagnosis within the NHS England National Bundle of Care for Children and Young People with Asthma should be kept up to date and implemented universally.[123]
- To address training and registration issues, ARTP should consider making combined certification available for both adults and children and young people, to recognise the skills and experience gained by providing one service and encouraging this to be applied in practice to all people with lung conditions who are able to complete testing, irrespective of their age.

9. Future Developments in Diagnostics

Breathlessness pathway
We were pleased to see the development of the **Pre diagnosis breathlessness pathway – Adult breathlessness pathway (pre-diagnosis): diagnostic pathway support tool**,[124] which has been developed for adults experiencing chronic persistent breathlessness of more than 8 weeks' duration in England. Pilots are now underway in Sussex, Hull and Oldham and we expect results to be collected and published by NHS England in the latter half of 2023. We hope to see greater clarity on how the diagnosis of asthma and COPD will fit within the breathlessness pathway, and for the pathway as it develops to improve both speed of diagnosis and symptom management at the time of diagnosis in primary care.[125,126,127,128] This is because it is important for clinicians to provide symptom relief whilst tests to establish the cause of breathlessness are ongoing.

Case study seven:

Queen Victoria Hospital NHS Foundation Trust CDC Breathlessness Pathway Pilot, Sussex
The Adult Breathlessness Pathway (pre-diagnosis): Diagnostic Pathway Support Tool is being piloted in several sites including Queen Victoria Hospital NHS Foundation Trust's Community Diagnostic Centre through the outpatient setting.

Pre-referral: Information from primary care informs initial triage which determines whether to send patients for preliminary respiratory or cardiac investigations. The quality of this referral information is vital as the pathway is primarily a virtual one, so secondary care physicians depend on this information to add to diagnostic test results in order to draw diagnostic conclusions.

Referral is completed electronically.

Crucially, a co-ordinator summarises the key features of the referral for triage, to help make best use of clinical time. The patient's position in the pathway is kept up to date electronically so this can be viewed at any time by both primary and secondary care.

Tests are booked for the patient with the aim of completing them all in one visit.
An asynchronous MDT to discuss test results is conducted electronically involving both primary and secondary care input.

Results:
Patients are referred to secondary care or back to primary care depending on their results. A summary of the results, including the secondary care opinion on diagnosis and advice on management, is generated for the primary care record.

Key challenges:
Challenges include short-term funding for recruitment, additional roles for the workforce and managing inappropriate referrals, and balancing demand with timely delivery.
Ensuring quality referrals through dialogue with primary care is key, as a CDC service for diagnostic testing should not be used to replace other referrals to secondary care.

Solutions:
Training and skill development for the workforce, and feedback on referrals, have helped to address these issues. The team also advise that allocating sufficient clinical time to help with training, support and supervision has been key to the project's success, and this should not be underestimated.

Pilot results:

- A snapshot indicated a mean pathway length from referral to diagnosis of just 50 days. This compares to average local wait times between GP referral via traditional routes and the patient's first appointment with a secondary care consultant of 80 days in cardiology and 105 days for respiratory clinic appointments.
- 93% (110/118) of patients received all their planned tests on a single day.
- As the Sussex site are now moving from the pilot phase to business as usual, they are continuing to expand the service to additional practices in their area. This requires the CDC to employ specific roles to provide the service.

For further information and to contact the Sussex team with any queries, please email **policy@asthmaandlung.org.uk**

Now it has been published, we would like to see wider implementation of the breathlessness pathway so as many people with unexplained breathlessness as possible can benefit. The roll-out of the pathway will guide which tests happen where, such as within general practice or at a Community Diagnostic Centre (CDC).

Alternative technical solutions in development: research developments

Use of artificial intelligence (AI) in spirometry:
In years to come, we expect to see the development of alternative diagnostic tests and tools, including remote or handheld lung function testing devices and the use of artificial intelligence (AI) to aid spirometry interpretation and reporting. This could help to quality assure testing results, solve existing workforce capacity issues, and identify human errors.

The use of AI in spirometry promises the potential of automated quality control in real time, to give feedback on the quality of the spirometry data as it is being delivered, and to confirm interpretation results. Better quality spirometry could help to avoid misdiagnosis of conditions such as asthma, and inappropriate use of medication, such as inhalers. It could also help to address geographical inequalities, as quality of care would not depend on the location of lung function labs or other staff qualified to interpret the test results.

The use of AI could allow for the provision of a more cost-effective service by allowing for the use of varied staff grades to fulfil the different roles required for delivery and interpretation of the tests within a multidisciplinary team with appropriate skill mix.

A good clinical history and examination would still be needed following the use of AI in spirometry to confirm a diagnosis.

Developments like these could allow for new models of care which allow for patients to test themselves at home, like 24-hour blood pressure monitoring. This could be easier and preferable for patients.

Research is ongoing into the use of AI in spirometry.[129] AI is being piloted in secondary care to quality assure the performance and interpretation of spirometry, and this should be available more widely in the medium term. AI is also being evaluated in primary care spirometry pathways as part of a National Institute

for Health and Care Research (NIHR) funding award.[130] For contact details and to find out more, please contact **policy@asthmaandlung.org.uk**

Developing evidence for more widespread use of impulse oscillometry:
Another alternative test worthy of further research is impulse oscillometry (iOS), which is a way to measure how well the lungs work using sound waves. Lung function tests for people with conditions such as idiopathic pulmonary fibrosis (IPF) require a lot of tiring effort, and can make them cough or feel very breathless.

Impulse oscillometry, on the other hand, uses a portable machine suitable for primary care to generate non-invasive sound waves to measure the elasticity of the lung. This test is quick and effortless, as it only requires a person to breathe as they normally would. It could also be suitable for other conditions including COPD and asthma.

Quicker tests like these could reduce pressure on departments performing testing and reduce appointment waiting times. Easier tests like these could also improve monitoring for those who struggle to complete traditional lung function tests, such as children, or adults with severe symptoms, and may not require the same kind of technical interpretation which makes traditional tests like spirometry more labour intensive to provide.

More research is needed to establish how impulse oscillometry compares to other traditional lung function tests, in terms of both patient experience and meaningful results, and to gather further evidence to confirm which conditions this could be useful for. Research is ongoing in this area and further results should be available at the end of 2023.

Further investment in research and innovation, including implementation, is needed to allow potential developments to reach their full potential and allow patients for whom traditional tests are unsuitable to be able to access these alternative tests as soon as possible.

However, if basic tests like spirometry are adequately supported with training and funding, there will be less need for innovation to develop alternatives. Those working in primary care should not wait until alternative solutions are developed, as action is needed now to help clear the backlog and give patients the diagnosis that they need.

Policy recommendations

For ICBs/ ICSs:

- Swift introduction of the new pre-diagnosis breathlessness pathway for adults: we need to see wider promotion and roll-out of this pathway within integrated care systems in the next 12 months, to ensure widespread uptake so people with lung health conditions have more consistent and rapid access to diagnosis.
- We ask you to review clinical lung health pathways across the ICS to ensure best practice is learnt and adopted from place-level to place-level, and that respiratory health is prioritised within your population health management focus.

For NHS England:

- The results of the pilots of the breathlessness pathway must also be analysed as soon as possible,[131,132] to scope out and understand the staffing models needed so the pathway can enable rapid diagnosis for all those who need it.

Research:

- a) Investigate the best ways to train staff/ support them to interpret results.
- b) Investigate possibilities around home monitoring/ digital testing.
- c) Investigate service delivery, to establish how different models may work best for varied local settings.

Conclusion

Accessible diagnostic tests are crucial for timely and accurate diagnosis.

There are currently widespread challenges with the delivery and timely provision of key diagnostics, such as spirometry, following the pandemic.

Urgent action is needed now to clear the backlog. However, provision of diagnostic testing was also poor pre-pandemic. We need to do better for people with lung conditions.

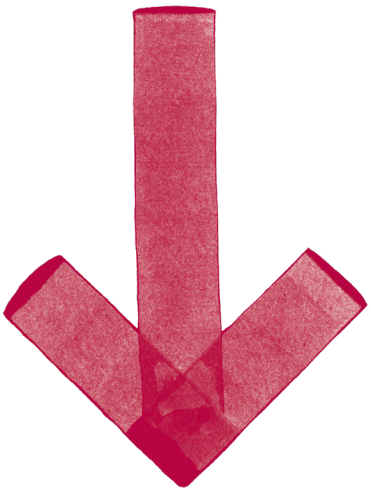
The establishment of Integrated Care Systems (ICSs) provides an opportunity to address this, and greater scope for local planning and to prioritise respiratory diagnostics, which is deeply needed.

The case studies in this report highlight best practice in different areas, and the varied ways to address challenges with workforce and funding issues, through solutions such as apprenticeships or incentive schemes.

Community Diagnostic Centres (CDCs) are not designed to replace current primary care provision. They are part of the solution to the issues with primary care diagnostics for lung conditions, but CDCs were always intended to add capacity, not replace it from primary care. Action is still needed elsewhere in primary care. As such, services should not rely on CDCs to meet diagnostic demand in their area.

The future for diagnostics promises some interesting alternative solutions, such as the use of AI, which has great potential. However, we cannot wait for alternative solutions to be developed: action is needed now to prioritise respiratory diagnostics for people with lung conditions.

In summary, we are calling for:



Key policy recommendations

- **Prioritise respiratory health at ICS level:** Each area should have a local policy about respiratory testing that ensures that NICE guidelines are followed.
- **Integrated Care Boards (ICBs) should develop business cases for respiratory diagnostics** in their area, assessing local need and investing the necessary resources and training, knowing that this is cost effective. If this requires dedicated funding, this should be prioritised.
- **Ensure a respiratory lead in each ICS**.
- **Workforce:** ICBs should have a clear and strategic view of current and future demand on their service and should plan to adequately meet this demand for their population, ensuring that there is an appropriately qualified workforce in place.
- Current practice shows that a number of workforce models are being implemented successfully. ICBs should identify which model will suit their area best.
- **Training:** ICBs should prioritise delivery of training to ensure their respiratory workforce are able to perform/interpret spirometry results with appropriate certification.
- **Estates and Infection Prevention and Control (IPC):** read the latest guidance on managing the risk of respiratory infection as endemic and ensure universal access to quality-assured spirometry for all that need it.
- **Funding spirometry:** specific funding is needed to improve spirometry training at primary care level.
- Recognise ***all*** costs involved for any provider who wants to provide respiratory tests.
- Develop local payment mechanisms to ensure no one is disadvantaged by setting up a service to meet local needs. Funding should be made available via GP or PCN contracts, or any other suitable mechanisms.
- Ensure that all patients have equitable access to these tests with appropriate governance around the quality of provision and interpretation.
- Providers also need scope to use funding allocated for spirometry training more broadly to cover costs of overheads. Greater flexibility for ICBs to allocate funding where it is most needed would be much more useful.
- Spirometry should be incentivised as a paid-for diagnostic test within the GP contract, until a standardised national or guide tariff for diagnostic testing for different settings can be developed.
- **The role of CDCs:** ICBs should take the role of CDCs carefully into account, ensuring integrated provision across primary care. CDCs should not be relied upon as the sole provider of respiratory diagnostic tests.
- We ask your ICS to restart quality-assured spirometry in primary care in full by the end of the 2023/24 financial year, and to ensure that these tests are available at all community diagnostic hubs, regardless of size or classification.
- NHS England should provide clear guidance that CDCs are intended to boost diagnostic capacity alongside provision in primary care and are unlikely to be able to deliver all respiratory diagnostic testing, even when fully up and running.
- **Targeted Lung Health Checks (TLHCs):** people presenting to TLHCs with respiratory symptoms should have spirometry performed, as per the recommendation in the TLHC national protocol. This is a diagnostic test, not screening.
- **Children and Young People (CYP):** recommendations on early and accurate diagnosis within the NHS England National Bundle of Care for Children and Young People with Asthma should be kept up to date and implemented universally.

- To address training and registration issues, ARTP should consider making combined certification available for both adults and children and young people, to recognise the skills and experience gained by providing one service and encouraging this to be applied in practice to all people with lung conditions who are able to complete testing, irrespective of their age.
- **Future developments: swift introduction of the new pre-diagnosis breathlessness pathway for adults:** we need to see wider promotion and roll-out of this pathway within ICSs in the next 12 months, to ensure widespread uptake so people with lung health conditions have more consistent and rapid access to diagnosis.
- The results of the pilots of the breathlessness pathway must also be analysed by NHS England as soon as possible, to scope out and understand the staffing models needed so the pathway can enable rapid diagnosis for all those who need it.
- **Research:**

a) Investigate the best ways to train staff/ support them to interpret results.

b) Investigate possibilities around home monitoring/ digital testing.

c) Investigate service delivery, to establish how different models may work best for varied local settings.

About this report

This report was written by **Rachel Warren**.

Special thanks to **Jon Foster**, **Laura Williamson**, **Sarah MacFadyen**, **Andy Whittamore**, and **Nick Hopkinson**, and all those who contributed to the drafting of this report.

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info@asthmaandlung.org.uk
AsthmaAndLung.org.uk
0300 222 5800

ASTHMA+
LUNG UK