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Issue 1
SPRING 2017

Primary Care Respiratory **UPDATE**




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Reference: 1. Hubbard GP et al. Clin Nutr. 2012;31;293–312.

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Primary Care Respiratory **UPDATE**

The *Primary Care Respiratory Update* is published quarterly and distributed to members of the Primary Care Respiratory Society UK.

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See http://www.pcrs-uk.org/sites/pcrs-uk.org/files/files/PI_funding.pdf for PCRS-UK statement on pharmaceutical funding.

The Benefits of Bi-Directional Data Exchange between Medical Devices and Electronic Medical Record Systems

History of Electronic Medical Records

The idea of recording patient information electronically, the Electronic Medical Record (EMR), has been around since the late 1960's when Larry Weed MD introduced the concept of the 'Problem Oriented Medical Record' into medical practice. Until then, doctors usually only recorded their diagnoses and the treatment they provided. Weed's innovation was to generate a record that would allow a third party to independently verify the diagnosis. In 1972 the Regenstreif Institute in Indiana, USA, developed the first medical records system and although the concept was widely hailed as a major advance in medical practice the use of such systems did not become widespread until the mid-2000's.

Lawrence Weed M.D.

Medical Records That Guide And Teach (I y II). The New England Journal Of Medicine 1968; 278(11): 593-600 y 1968; 278(12): 652-7.

Medical Records, Medical Education, and Patient Care. The Problem Oriented Record as a Basic Tool.
Copyright 1969, 1970 by The Press Of Case Western Reserve. University, Cleveland, Ohio

Primary Care EMRs

Today, the use of EMRs within the UK primary care arena is well established with three key providers, EMIS™, iNPS (Vision®) and TPP (SystmOne®) dominating the market. However, whilst the computerised management of the patient's journey from visit scheduling through to diagnosis and treatment pathways is broadly in place, the ability to automate the transfer of critical diagnostic device test data is less common.

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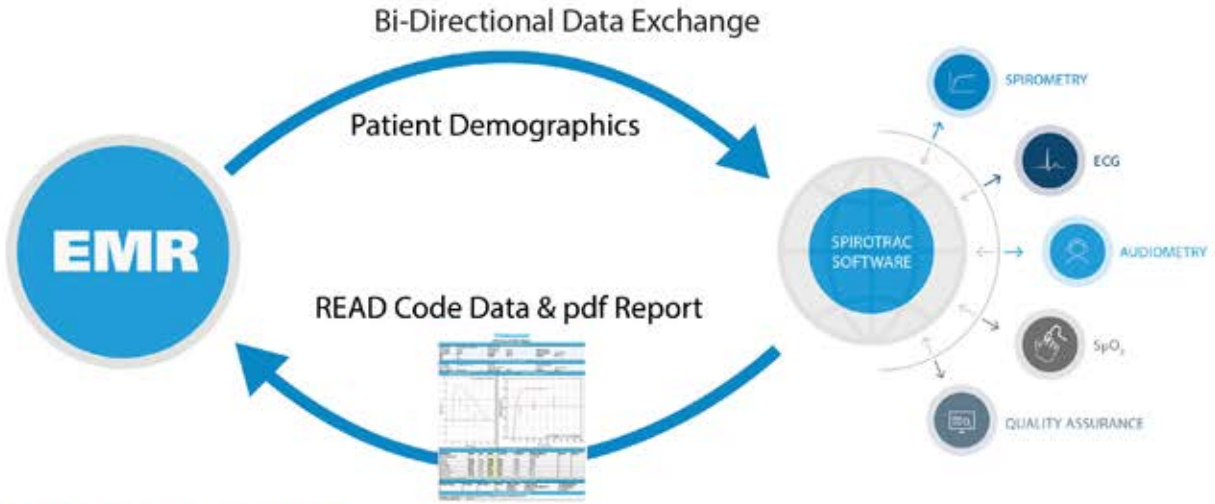

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** Data exchange of certain test parameters with specific electronic medical record systems may be at different stages of development.*

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Primary Care Respiratory **UPDATE**




SPECIAL FEATURES

REGULAR FEATURES

SPECIAL PULL-OUT FEATURE

HOW DO YOU EMPOWER THEM TO QUIT FOR GOOD?

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1. Cahill et al, Cochrane summaries, 2013

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Nicorette Invisi Patch Prescribing Information: Presentation: Transdermal delivery system available in 3 sizes (25.5, 13.5 and 7cm2) releasing 25mg, 15mg and 10mg of nicotine respectively over 16 hours. **Uses:** Nicorette Invisi Patch relieves tobacco cravings and nicotine withdrawal symptoms associated with tobacco dependence. It is indicated to aid smokers wishing to quit or reduce prior to quitting, to assist smokers who are unwilling or unable to smoke, and as a safer alternative to smoking for smokers and those around them. Nicorette Invisi Patch is indicated in pregnant and lactating women making a quit attempt. If possible, Nicorette Invisi Patch should be used in conjunction with a behavioural support programme. **Dosage:** It is intended that the patch be worn through the waking hours (approximately 16 hours) being applied on waking and removed at bedtime. *Smoking Cessation Adults (over 18 years of age):* For best results, most smokers are recommended to start on 25 mg / 16 hours patch (Step 1) and use one patch daily for 8 weeks. Gradual weaning from the patch should then be initiated. One 15 mg/16 hours patch (Step 2) should be used daily for 2 weeks followed by one 10 mg/16 hours patch (Step 3) daily for 2 weeks. Lighter smokers (i.e. those who smoke less than 10 cigarettes per day) are recommended to start on Step 2 (15 mg) for 8 weeks and decrease the dose to 10 mg for the final 4 weeks. Those who experience ill-ossible side effects with the 25 mg patch (Step 1), with the most notable within a few days, should change to a 15 mg patch (Step 2). This should be continued for the remainder of the 8 week course, before stepping down to the 10 mg patch (Step 3) for 4 weeks, if symptoms persist the patch or a healthcare professional should be sought. *Adolescents (12 to 18 years):* Dose and method of use are as for adults however, recommended treatment duration is 12 weeks. If longer treatment is required, advice from a healthcare professional should be sought. *Smoking Reduction Pre-Quit:* Smokers are recommended to use the patch to prolong smoke-free intervals and with the intention to reduce smoking as much as possible. Starting dose should follow the smoking cessation instructions above (i.e. 25mg (Step 1) is suitable for those who smoke 10 or more cigarettes per day and for lighter smokers are recommended to start at Step 2 (15 mg). Smokers planning on 15mg patch should transfer to 10mg patch as soon as cigarette consumption reduces to less than 10 cigarettes per day. A quit attempt should be made as soon as the smoker feels ready. When making a quit attempt smokers who have reduced to less than 10 cigarettes per day are recommended to continue at Step 2 (15 mg) for 8 weeks and decrease the dose to 10 mg (Step 3) for the final 4 weeks. *Temporary Abstinence:* Use a Nicorette Invisi Patch in those situations when you can't or do not want to smoke for prolonged periods (greater than 16 hours). For shorter periods when an immediate intermittent dose form is more suitable (e.g. Nicorette inhalator or gum). Smokers of 10 or more cigarettes per day are recommended to use 25mg patch and lighter smokers are recommended to use 15mg patch. **Contraindications:** Hypersensitivity. **Precautions:** Underlying cardiovascular disease, diabetes mellitus, renal or hepatic impairment, pheochromocytoma, or uncontrolled hyperthyroidism, generalised dermatological disorders, gastrointestinal disease. Angioedema and urticaria have been reported. Erythema may occur. If severe or persistent, discontinue treatment. Stopping smoking may alter the metabolism of certain drugs. Transferred dependence is rare and less harmful and easier to break than smoking dependence. May enhance the haemodynamic effects of, and pain response to, adenosine. Keep out of reach and sight of children and dispose of with care. Should be removed prior to undergoing MRI procedures. **Pregnancy and lactation:** Only after consulting a healthcare professional. **Side effects:** Very common: pruritus. Common: headache, dizziness, nausea, rash, urticaria, vomiting. Uncommon: hypersensitivity, palpitations, urticaria, paraesthesia, tachycardia, flushing, hypertension, tachycardiosis, irritation, application site reactions, asthenia, chest discomfort and pain, malaise, fatigue, dizziness. Rare: Anaphylactic reaction, GI disorders, angioedema, erythema, pain in extremity. Very rare: reversible atrial fibrillation. See SPC for further details. **NHS cost:** 25mg packs of 7: £10.97, 25mg packs of 14: £17.00, 15mg packs of 7: £10.97, 10mg packs of 7: £10.97. **Legal category:** GSL. **PL holder:** McNeil Products Ltd, Piscataway Way, Maidenhead, Berkshire, SL6 3UG. **PL numbers:** 15513/0161; 15513/0163; 15513/0159. **Date of preparation:** May 2016

Nicorette QuickMist Prescribing Information: Presentation: oromucosal spray. Each 0.07ml contains 1mg nicotine, corresponding to 1mg nicotine/spray dose. **Uses:** relieves and/or prevents craving and nicotine withdrawal symptoms. Indicated with tobacco dependence. It is indicated to aid smokers wishing to quit or reduce prior to quitting, to assist smokers who are unwilling or unable to smoke, and as a safer alternative to smoking for smokers and those around them. It is indicated in pregnant and lactating women making a quit attempt. **Dosage:** *Adults and Children over 12 years of age:* the patient should make every effort to stop smoking completely during treatment with Nicorette QuickMist. One or two sprays to be used when cigarettes normally would have been smoked or if cravings emerge. If after the first spray one finds one is not controlled within a few minutes, a second spray should be used. If 2 sprays are required, future doses may be delivered as 2 consecutive sprays. Most smokers will require 1-2 sprays every 30 minutes to 1 hour. Up to 4 sprays per hour may be used, not exceeding 2 sprays per dosing episode and 64 sprays in any 24-hour period. Nicorette QuickMist should not used when either the urge to smoke is mild or no powerful cravings in situations where these are likely to occur. Smoker unwilling unable to stop smoking immediately should initially replace all their cigarettes with the Nicorette QuickMist and as soon as they are able, reduce the number of sprays used until they have ceased completely. When making a quit attempt behavioural therapy, advice and support will normally improve the success rate. Smokers aiming to reduce cigarettes should use the Mouthspray as needed, between smoking episodes to prolong smoke-free intervals and with the intention to reduce smoking as much as possible. **Contraindications:** children under 12 years of age and hypersensitivity to any of the ingredients. **Precautions:** uncontrolled active diseases, diabetes mellitus, GI disease, uncontrolled hyperthyroidism, pheochromocytoma, hepatic or renal impairment. Stopping smoking may alter the metabolism of certain drugs. Transferred dependence is rare and less harmful and easier to break than smoking dependence. May enhance the haemodynamic effects of, and pain response to, adenosine. Keep out of reach and sight of children and dispose of with care. **Pregnancy & lactation:** Smoking cessation during pregnancy should be achieved without NRT. However, if the mother cannot or is considered unlikely to quit without pharmacological support, NRT may be used after consulting a healthcare professional. **Side effects:** dry mouth/throat, hiccups, cough, throat irritation, nausea, hiccups. *Common:* headache, hypersensitivity, burning sensation, taste disturbance, dyspepsia, paraesthesia, abdominal pain, stomatitis, dry mouth, flatulence, salivary hypersecretion, somnolence, vomiting, dyspepsia, fatigue. *Uncommon:* abnormal dreams, palpitations, tachycardia, flushing, hypertension, bronchospasm, dysphonia, dysgeusia, nasal congestion, sneezing, throat irritation, eructation, glossitis, oral mucosal blistering and exfoliation, paraesthesia oral, oral pain, urticaria, angioedema, hyperhidrosis, pruritus, rash, erythema, pain in jaw, asthenia, chest discomfort and pain, malaise, cryptogenic organising pneumonia, gingivitis, musculoskeletal pain, hypertonia. *Rare:* dysphagia, hypokinesia, oral, vesicular, *Not known:* atrial fibrillation, allergic/toxic reaction, blurred vision, taste reaction increased, dry throat, GI discomfort, lip pain, reversible dizziness, angioedema, erythema. **NHS cost:** 1 dispenser pack £12.12, 2 dispenser pack £19.14. **Legal category:** GSL. **PL holder:** McNeil Products Ltd, Piscataway Way, Maidenhead, Berkshire, SL6 3UG. **PL number:** 15513/0057. **Date of preparation:** July 2016.

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to McNeil Products Limited on 01344 864 042.

Date of Preparation: August 2016 UKNIF16-7099(1)

Editor's Round-Up

Dr Iain Small, *Editor Primary Care Respiratory Update*

Welcome to this edition of *Primary Care Respiratory Update*. It comes to you with a new Editor but, we hope, with the same practical approach that you have come to expect, and have valued so much. The foundation of *Primary Care Respiratory Update* was an important step in the Primary Care Respiratory Society UK's progress, and could not have happened without the tireless work and profound influence of its first Editor, Professor Hilary Pinnock. Having the researcher's eye for detail whilst, as a clinician, understanding the big picture, has always been her strength, one that she consistently brought to these pages. The Society and *Primary Care Respiratory Update* readership thank you Hilary; on a personal note, I am glad that your vision and mine were (for once) the same. While we are on the subject of Editorial change, I would also want to acknowledge the work of Dr Paul Stephenson, who is stepping down from his many years of service to *npj Primary Care Respiratory Medicine* and before that the *Primary Care Respiratory Journal* ... may the road rise to meet you both.

So onwards we go, starting our new beginning at the beginning. "Diagnosis Diagnosis Diagnosis". As a former Chair of our Society is fond of saying, "It is a basic human right to receive an early and accurate diagnosis", and we, as clinicians, have a responsibility to ensure that not only is this part of our approach to patient care, but that reviewing patients with existing diagnoses starts with the questions "is the diagnosis correct" and "is there a new additional diagnosis"?

Noel Baxter sets us off on the right track by reviewing the current (sometimes challenging) evidence around the misdiagnosis of respiratory disease. He highlights the reasons why we need to see improvement, suggesting both improved structure in our diagnostic method and a symptom-based approach to the breathless patient. The impact of getting the right diagnosis is great; the consequences of getting it wrong, for our patients, can be significant.

Those consequences are explored in a deeply personal story shared by PCRS UK Lay Representative Barbara Preston, who highlights not only the importance of owning one's own diagnosis, but of ensuring that it 'travels with us' throughout our changing circumstances. Looking back to a time before CT scanners may take some readers back to the days of trying to diagnose bronchiectasis using sputum culture and bronchograms.

Throughout this issue we have the opportunity to learn about making an early and accurate diagnosis in a number of ways:

- We have brought you cases from the International Primary Care Respiratory Group (IPCRG)'s 'asthmaxchange' series, with three challenging examples, presented with humour – opening blind alleys and introducing uncertainty – just like the real world. We are grateful to IPCRG for allowing their use; you can access their materials at http://www.theipcrg.org/
- In her policy update, Bronwen Thomson reminds us of the National Spirometry Registration scheme and the new GOLD chronic obstructive pulmonary disease (COPD) guidelines.
- Diagnostic misadventure can also be found in a number of articles highlighted in our journal watch feature.
- There is also an extensive preview of the PCRS UK 2017 Conference programme, where issues around diagnosis feature heavily, both in practical skill sessions and case-based learning.
- Finally, I hope you find Duncan Keeley's practical guides to peak flow and microspirometry and the centrefold wallchart of particular use as a reminder of how to apply the different diagnostic tools we have at our disposal to the unique (and sometimes complex) presentation of the patients in your day-to-day practice.

My thanks to our Editorial Board for their support and effort, to our contributors in this edition, and to the dedicated hard working *PCRU* production team without whom none of this would be possible.

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The Primary Care Respiratory Academy is funded by Pfizer (on behalf of the Novartis-Pfizer Alliance).

Chair's Perspective

Noel Baxter, *PCRS-UK Executive Chair*

Early and accurate respiratory diagnosis: a patient safety issue needing more serious attention

Many respiratory interested healthcare professionals have expressed to me with frustration that the application of rigour and quality control for a diagnosis of diabetes mellitus or hypertension is not replicated as uniformly for respiratory symptoms or long-term respiratory disease. These conversations inevitably lead to why that is and then stories of the consequences.

Misdiagnosis as a patient safety issue has come to the fore in recent years in the mainstream journals. Two perspectives in the *New England Journal of Medicine* in 2015 reflect on the costs of misdiagnosis, the need for a root cause analysis when it occurs in order to improve systems and looks further, suggesting incentivising reductions in misdiagnosis rates.[1,2] One of the papers commented:

> *'With health care costing more than ever before, and missed or delayed diagnoses often resulting in higher downstream costs for treating more advanced disease, the financial implications of misdiagnosis can be substantial' – 10 per cent of diagnoses are incorrect.'*[1]

In respiratory medicine in recent years we have been hearing about not enough, too much and poor quality around asthma and COPD diagnosis. This suggests that respiratory diagnosis isn't always easy, maybe doesn't have the highest priority and therefore resources, and that we haven't yet adequately described or disseminated a structured approach towards assessing respiratory symptoms. Has our last decade of incentivisation taken us further down the road of misdiagnosis through linking income essential to primary care with prevalence on single disease registers and before being sure that the evidence can be implemented?

I remember in 2001 as a GP registrar my trainer walking into my room saying a new bit of kit had been delivered by the Primary Care Trust and did I want to try and work out how to use it? It was the first time I'd seen a spirometer and I had no idea what it was for – I confess it lay on the shelf and I never opened the box – I had other priorities in that year. Two years later I was a GP partner building a COPD and asthma register learning on the job, fast – I had to prove my added value! I spent subsequent years reviewing the quality and reflecting on the impact. Others will have done the same, and will be doing it still, but hopefully everyone has now recognised the need.

In October last year the respiratory community received a wake-up call about the need for accurate diagnosis with the publication of the COPD national audit.[3] This report revealed that, for 48,000 patients whose data were extracted from 62% of general practices in Wales, at best only about 50% of the population had evidence of a correct diagnosis of COPD and at worst the figure was as low as 15%.

The audit report was closely followed by a paper in the *Journal of the American Medical Association* (*JAMA*) in January 2017 reporting a prospective, multicentre cohort study that was conducted in 10 Canadian cities from January 2012 to February 2016 looking at whether asthma medication can be safely stopped in people with no current evidence of asthma.[4] The results suggested that, after review, 203 of the 613 randomly selected cohort diagnosed with asthma in the last 5 years did not have asthma.

These recent reports and research papers reinforce the current PCRS-UK campaign to raise awareness among healthcare professionals of the importance of diagnosing respiratory conditions early and accurately and of getting the basics right because diagnosis is a basic building block of quality care. Our campaign is working to change the culture and approach of healthcare professionals and to improve skills and competencies in making a diagnosis.

The problems that need to be addressed

Over or inappropriate use of treatment

In the early to mid-2000s there was a surge of optimism about the benefits of pharmacological treatment for people with COPD with the use of combination inhaled corticosteroid (ICS) long-acting beta agonist (LABA) and long-acting muscarinic antagonist (LAMA) inhalers. The previous nihilism around COPD therapy options led the respiratory community to hope that this would be the equivalent of statins for secondary prevention of heart disease. The unintended consequence was the widespread use of ICS in people who didn't fill the criteria for treatment and this led to unnecessary cost to the NHS through use of what were, at that time, inhalers that cost £30–60 per month. It also caused possible harm to patients including minor steroid side effects, pneumonia and, in theory, adrenal suppression which could put people at risk of a withdrawal-related adrenal crisis. Towards the latter part of that decade we then began to realise that we had problems with accurate diagnosis and that we were sometimes assuming people had COPD without being absolutely sure about it.

In your practice do you know:

- What proportion of people on the COPD register has a spirometric result, CT chest or gas diffusion test that confirms the diagnosis of COPD?
- What proportion of people with asthma on your register have a clear statement in the notes when the diagnosis was made that justifies starting what is essentially lifelong therapy?

Go to https://goo.gl/LX47gX to download the quality improvement slide kit following the primary care COPD audit by the Royal College of Physicians

Case study: cough

In the cough diagnosis case in our case studies article in this issue (see page 12), the diagnostician works with the woman in question to manage her expectations and share an approach towards finding the cause. Chronic cough can have many options, needs initial investigations and trials of therapy and it takes time. Opting for therapy before being clear on cause may result in therapy that doesn't work and disengagement.

Feedback: COPD or bronchiectasis?

A diagnostic difficulty, which we all face, is the patient with risks, symptoms and spirometry suggesting COPD but who may in fact have bronchiectasis. If this is the case, the treatments, patient education and supported self-management will be quite different. We don't present any easy answers to this, though the new GOLD guideline approach to assessing COPD for therapy does encourage us to focus on asking and recording exacerbations, so recognising those with higher numbers of flare-ups might help focus our thoughts on whether bronchiectasis is possible.[5] Each time people with bronchiectasis get another infection their lungs decline, so timely consideration is required. Our interview with Barbara Preston (see page 23), a member of the PCRS-UK Lay Reference Group, who had bronchiectasis as a child but was not diagnosed until she was an adult, illustrates how this delay to diagnosis impacts on the patient.

Incomplete diagnosis

The annual focus on the single disease Quality and Outcomes Framework (QOF) review such as COPD and heart failure also has consequences for missing other causes of respiratory symptoms such as breathlessness. We know that, by the time people have daily disabling breathlessness, it is likely they will have multimorbidity and people with COPD are at much higher risk of lung cancer which may present as a change in cough or breathlessness. Therefore, unless we develop systems to ensure we seek to obtain or exclude all of the diagnoses that might be causing a patient's chronic respiratory symptoms, we may leave people without the right care plan.

In another of the diagnosis cases in this edition (See page 14) an older male patient is assumed to have COPD quite reasonably, but it is only a year or two later through questioning the diagnosis at his 'flare-up' and in part due to continuity of care that his other diagnosis is revealed.

A new approach

Breathlessness is a very common problem – 10% of adults and 30% of older adults have been breathless every day for the last 3 months or longer. However, we do not seem to be recording this problem at these rates in our surgeries, outpatients and wards when studies have looked at presentation to health professionals. It is easy for patients to adapt to breathlessness and, indeed, to pass it off as not being a problem until it's late in its progression.

Do we routinely ask people about their breathlessness or offer them a test? It's not in any health check and what test could we do anyway?

So we need to be thinking about how we pick up people who are breathless much earlier. Ideally we need a policy from 'the centre' that looks at proactive breathlessness assessment as a value-based prevention strategy – whether it is a question about an aspect of someone's breathlessness, a fitness test or online breathlessness quiz. We have already had two very successful national media campaigns which ran last summer – the Public Health England Be Clear on Cancer Campaign, which raised awareness of the symptoms of breathlessness, and the British Lung Foundation Listen to your Lungs Campaign, which encouraged people to ask healthcare professionals about their breathlessness and do an online breathlessness assessment test (See https://breathtest.blf.org.uk/). Over 200,000 people have used this test since it was launched. This focus at national level is very welcome in encouraging people to think about breathlessness.

Would it now make sense as we start to redesign QOF and our wider incentive system – a process that has already started in Scotland – to reward quality of diagnosis and not just the diagnosis itself? Of course we will need a diagnostic guideline everyone can agree with and an agreed stepped assessment process for respiratory symptoms such as cough and breathlessness where each step is manageable for both patient and diagnostician and at the end a diagnosis everyone can believe.

Take home message

The important message that clinicians need to take on board when diagnosing respiratory disease is that they need to be clear about what it is they need to do to achieve an early and accurate diagnosis and that they are trained to carry out that role.

If clinicians feel confident about the diagnosis they have made, it follows that patients will feel more reassured about their diagnosis because they will understand it and know how it has been arrived at. This will encourage them to adhere to the therapy or treatment they have been prescribed. Only then will we be able to feel confident that our patients are receiving optimal care.

Diagnosis – the basic building block of good respiratory care

- Respiratory diagnosis is a complex process and needs to be taken seriously by the whole team. It requires:
  - a structured systematic approach: a person activated to ask for help, a responsive system and a diagnostician who has a clear path to follow that everyone understands, referral for objective tests by someone trained to do them and a cycle of regular review (this will not be achieved within a one-off single 10 minute consultation);
  - objective evidence from tests, clinical judgement and shared decision making.
- Think symptoms (e.g. cough, breathlessness) and explore these with an open mind. Avoid pre-determined diagnoses for asthma/COPD (e.g. it is too easy to think that a smoker with cough or breathlessness has COPD or that a young child with cough or wheeze always has asthma).
- Existing respiratory diagnoses need to be validated/confirmed and not taken for granted.

This edition sees an editorial change; we say goodbye to Hilary Pinnock and welcome Iain Small as Editor. Hilary has successfully developed Primary Care Respiratory Update *to become a popular update for grassroots members. Her strong academic credentials and eye for detail has ensured that its content informs and is highly respected. We look forward to Iain, already a member of the editorial team, who will contribute his own inspirational brand of challenge and humour.*

Reference

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Are you confident in your diagnosis of asthma? Three case histories to challenge you

Noel Baxter, *PCRS-UK Executive Chair*

Achieving an accurate diagnosis may take time and involves working with patients to help support their understanding about why there isn't always a quick answer or an immediate prescription. This is particularly the case with asthma. It is a variable and reversible condition, so measurements over time are key to help you and the patient feel confident about what you are treating.

The International Primary Care Respiratory Group (IPCRG) with 'asthmaxchange' have developed learning modules that include some real-life histories to work through in the diagnosis, management and ongoing support for people with asthma.

The three diagnosis cases highlight the opportunities that exist, particularly in primary care because of the ability to have regular contact over time with people to review results, response to treatment and to get the diagnosis right.

This case highlights that, even with difficult scenarios such as with Mei and her chronic cough, following a systematic approach supports you feeling confident that you got it right.

Case 1 – Make the most of the acute presentation when considering the possibility of a long-term condition diagnosis

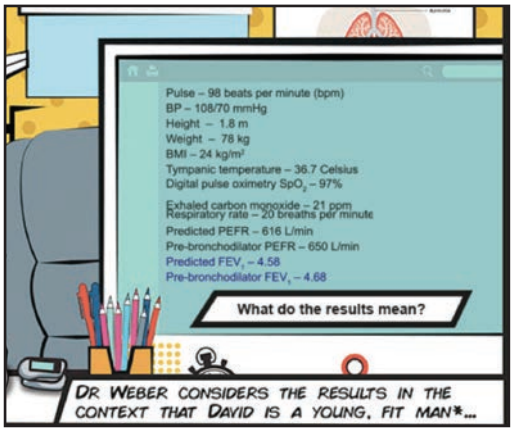
David is a new patient who comes to see you late on a Friday afternoon in your duty surgery.

At first you wonder whether he is breathless because he rushed here before you close but soon you notice a few minutes into the consultation that his breathing is rapid, not settling, he doesn't complete sentences and he is beginning to look scared.

continued...

Case 1 – continued…

The history David shares is likely to help you make a diagnosis so spend time considering this. The exam can help support your initial conclusions and the investigations should be the final stage. What is the relevance of the clinical examination findings noted above?



- David is a young, fit man but his heart rate is nearly 100 and his respiratory rate about double what it should be for someone his age. This means he is unwell
- He describes his chest as feeling tight and when I listen there is wheeze on both sides
  - It's a problem that has developed over a few days and one that David has experienced at least once in the past year. This scenario most likely suggests airway obstruction or new onset of asthma, and treatment of airway obstruction should help make this diagnosis; I must first exclude other conditions
- This case is complicated because his clinical presentation is airway obstruction and the numbers (FEV_1) don't fit with the clinical picture. I would expect an FEV_1 to be <70% predicted value
- Airway obstruction/asthma is diagnosed predominantly clinically so response to bronchodilator is an important next step; I will need to perform a reversibility test to either confirm the first suspected cause or lead me to consider another
- He is acutely unwell but his saturations are ok; he is scared but not confused so I'm confident to continue the assessment in my surgery rather than call an ambulance; though I am continuing to monitor and have oxygen and emergency kit available should the situation change

Which options would you choose next?

Dr Weber chooses option 5. She is using this opportunity to do a reversibility test. She is using a large volume spacer and pMDI to demonstrate to David – if asthma is confirmed – that you don't need special equipment to start to self manage an asthma attack.

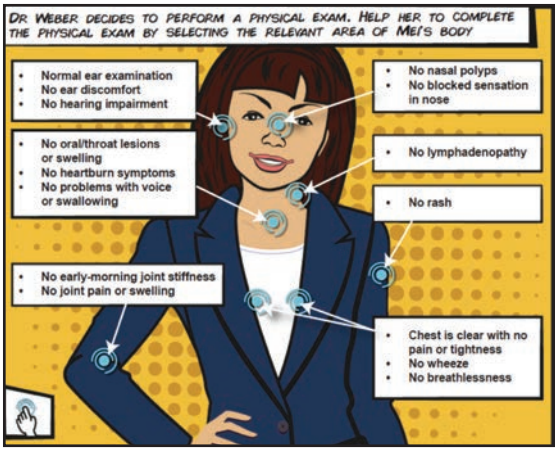
David feels better after the reversibility test making asthma a likely diagnosis. Taking time to both manage the acute event but also consider future care will save time in the long run.

- Seeing a treatment-naïve patient with suspected asthma in general practice is an ideal opportunity to start the process of making a confident diagnosis because significant reversibility can be best detected at this time
- PEFR and FEV_1 readings <70% of predicted contribute towards a suspicion of airways obstruction and should usually trigger a trial of therapy
- However, higher readings and supernormal values cannot rule out asthma until reversibility has been checked
  - A 200 mL improvement in FEV_1 after salbutamol is suggestive of reversible airway disease, although a 400 mL improvement is more convincing[1]
- Making an asthma diagnosis requires gathering as much evidence as possible, as no single test on any one day will absolutely confirm it
- Write down why you think it is asthma and then track it in order to:
  - convince yourself
  - convince your patient
- An unclear or uncommunicated diagnostic rationale results in poor patient adherence, and the consequences can be over-use, under-use, and misuse of therapies resulting in low-value healthcare
- This highlights the importance of performing differential diagnosis in patients with suspected asthma

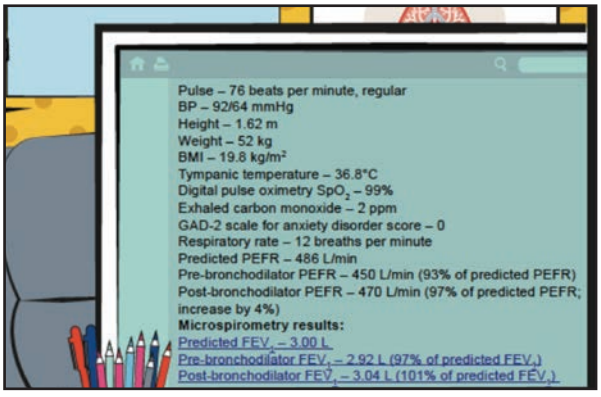
Case 2 – A systematic approach to diagnosing chronic cough

Managing chronic cough (a cough that lasts more than 8 weeks) can be a challenging process. We don't have a clear and definitive guideline to follow and the process often involves treatments as diagnostic aids. A systematic and shared approach is key to getting to the right answer.

Do you know why Dr Weber looked for these clinical signs below?



Do Mei's results lead you towards a specific diagnosis?



- Mei's principal symptom is her cough
  - Mei's physical exam does not suggest signs of atopy and her chest is clear, with no sign of wheezing
  - Her clinical assessment results appear to be normal
- This is a difficult situation and requires careful decision-making as well as managing Mei's expectations
- Dr Weber must also consider the timelines to either spontaneous recovery of Mei's cough or elucidation of cause through systematic testing

Mei is initially pushing for something to fix this quick and you can see why but you also know that the answer may not be available immediately and therefore you feel reluctant to treat before either knowing the cause or being clear about why you are providing therapy

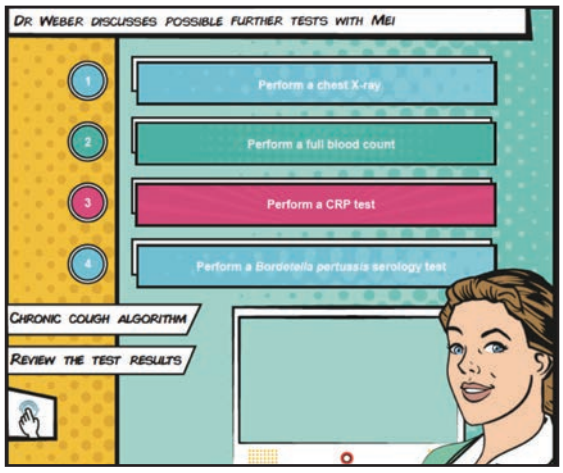
What would you do now?

- None of these options will provide a quick fix for Mei's cough
- Dr Weber must use her consultation skills to show empathy and manage Mei's expectations
- Dr Weber should inform Mei of the possible options and reasons for including or excluding them and a timeline
- After a short discussion, Dr Weber and Mei both agree a way forward
  - Mei understands that taking medicines without a diagnosis can be harmful and unlikely to be helpful
  - However, she now feels empowered to go back to her line manager and Occupational Health to explain what will happen next and the expected timelines; she feels they will be able to agree a work programme in the meantime that will make work less stressful

continued…

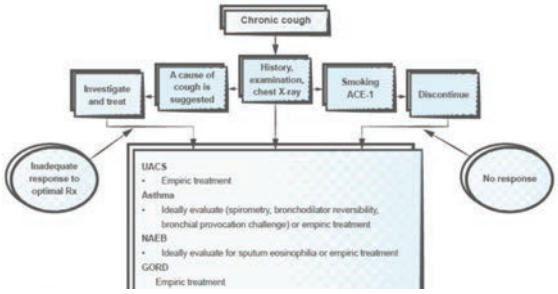
Case 2 – continued…

What are the tests you should do to exclude serious or communicable illness?



Mei's results are normal apart from a raised eosinophilia on the FBC.

Dr Weber now decides to progress through the chronic cough algorithm with Mei.

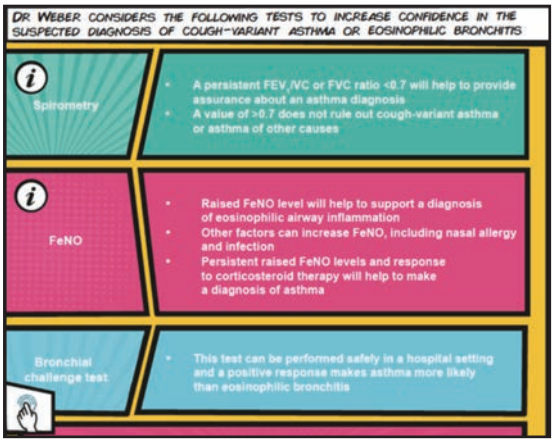


Dr Weber reviews Mei's results and notes that no condition is particularly clear but she has a shortlist of conditions for trials of therapy. These include i) upper airways cough syndrome (UACS), ii) asthma or cough variant asthma, iii) non-allergic eosinophilic bronchitis (NAEB) and iv) gastroesophageal reflux cough (GORD).

A recent review in *npj Primary Care Respiratory Medicine* of chronic cough with normal x-ray http://www.nature.com/articles/npjpcrm201581 determined the following diagnostic prevalence for chronic cough:

Diagnosis	n (%)
Asthma	75 (28.7)
Gastro-oesophageal reflux	56 (21.5)
ACEi use	37 (14.2)
Post-infective	30 (11.5)
Smoking	23 (8.8)
Upper airway pathology (rhinosinusitis)	17 (6.5)
COPD	5 (1.9)
Lower respiratory tract infection	4 (1.5)
Voluntary coughing/throat clearing	3 (1.1)
Malignancy	2 (0.8)
Bronchiectasis	1 (0.4)
Pulmonary fibrosis	1 (0.4)
Unexplained chronic cough	31 (11.9)
Spontaneously resolving	16 (6.1)
Persistent	15 (5.7)

Note: 19 patients (7.3%) had >1 diagnosis.
Abbreviations: ACEi, angiotensin-converting enzyme inhibitor; COPD, chronic obstructive pulmonary disease.



Dr Weber has access to spirometry only. Pre and post bronchodilator spirometry is perfomed. The tests show no reversibility and both tests sit within the normal range.

continued…

Case 2 – continued…

Mei opted for a trial of oral corticosteroid. Dr Weber and Mei discussed how they would know whether it worked.

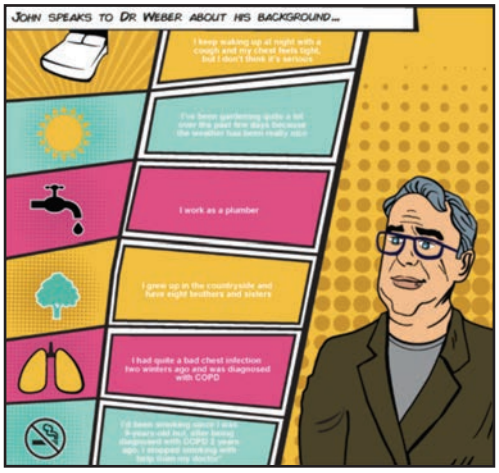
There are no primary care guidelines on how to assess a response in this scenario. However, various consensus statements by cough experts recommend a number of tests including the often-used generic visual analogue scale (VAS), which was used in Mei's case. The VAS requires the patient to record cough severity on a 100 mm linear scale, with 0 mm representing no cough and 100 mm representing the worst cough ever. A reduction of 20 mm represents an improvement

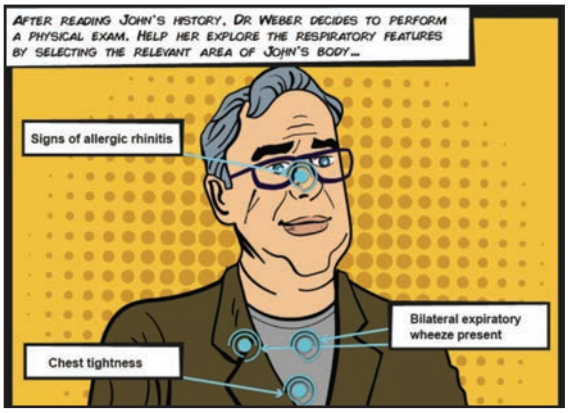
Mei's VAS results showed a 22.4 mm reduction in severity, which provided objective evidence of improvement. She also reported better quality of sleep and positive comments from work colleagues, providing reassurance that she had responded to treatment and that eosinophilic airway inflammation was a likely cause.

Dr Weber continued to treat Mei according to usual asthma therapy pathways. The final diagnosis was cough variant asthma. You can see more about Mei's results, the discussion she had with Dr Weber about trials of treatment for GORD and other decision and treatment algorithms at: https://www.asthmaxchange.com/e-learning/from-symptoms-to-diagnosis

Case 3 – Why good records and rechecking over time is key to better diagnosis

John comes to visit Dr Weber for antibiotics; he thinks he is getting another chest infection.

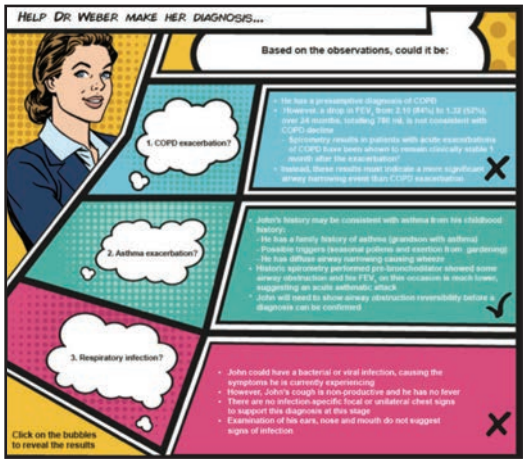




John has some desktop tests performed to help inform the findings from his history and examination

Pulse – 82 beats per minute (regular)
BP – 148/93 mmHg
Height – 1.55 m
Weight – 60 kg
BMI – 25 kg/m^2
Tympanic temperature – 36.5°C
Digital pulse oximetry SpO_2 – 94%
Exhaled carbon monoxide – 3 ppm
Respiratory rate – 22 breaths per minute
Predicted PEFR – 568 L/min
Pre-bronchodilator PEFR – 340 L/min (60% of predicted value)
FEV_1 – 1.32 L (52% of predicted value – 2.55 L)

Dr Weber already knows that John has airflow obstruction as he had quality assured spirometry 2 years ago. However, on that occasion his FEV_1 was 84% of predicted and today it is 52% of predicted. Dr Weber checks the quality again and ensures the details are correct and that the flow volume loop is suggestive of what the numbers say.



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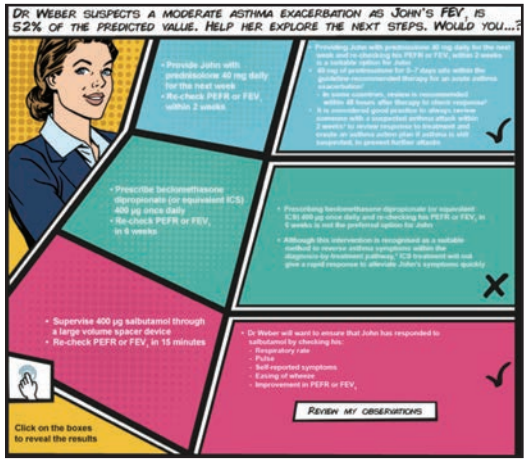
Case 3 – continued …

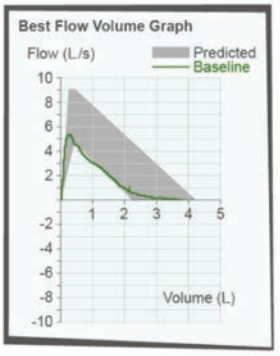


- From the two suitable options, Dr Weber decides to provide John with prednisolone 40 mg daily for the next week and re-check his PEFR or FEV_1 within 2 weeks
  - If John does respond to salbutamol, Dr Weber will want to give him some definitive treatment that she can be sure he will reliably take and which will alleviate his symptoms quickly
  - Therefore, prednisolone is indicated in this situation:
    - Oral steroids are associated with side effects. However, there is a greater risk to John's health from not treating the airway inflammation effectively
    - John has limited experience with inhalers; therefore, oral steroids seemed more appropriate in this case
    - Oral steroids have a fast onset of action, which will reduce John's symptoms quickly
- Even when considering an acute exacerbation of COPD, Dr Weber decides not to give John antibiotics as he does not show signs of infection (e.g. non-productive cough, no fever)
- Seeing John at 48 hours (or earlier if needed), 1 or 2 weeks, and 6 weeks will help Dr Weber gather information to reassess and communicate the diagnosis to John

John was seen 5 days later and the response convinced Dr Weber that there is a significant reversible and irreversible element to his airways disease.

- John feels much better
- His spirometry readings show his FEV_1 has returned to baseline, confirming reversibility with prednisolone
- His FEV_1/FVC ratio continues to show airway obstruction

Index	Base	%Pred
FEV_1	2.13 l	86%
FVC	3.82 l	118%
PEF	322 l/min	75%
FEV_1/FVC	56%	75%



FEV1 = forced expiratory volume in 1 second; FVC = forced vital capacity; PEF = peak expiratory flow; PEFR = peak expiratory flow rate.

The learning point for Dr Weber here was that, even when you make a good quality diagnosis for breathlessness, it is likely that another condition may be present and so revisiting the diagnosis in a structured way is key to being a holistic practitioner. The asthma/COPD mix can only be determined by knowing people over time or having good records to review over time.

Patient safety tip: John was using a LAMA and SABA for mild COPD when he first presented. People with asthma on long acting bronchodilators with no inhaled steroids have poor outcomes. People with COPD have symptoms that decline slowly; if there is a more rapid progression or a greater frequency of flare ups, review the diagnosis by starting again, checking what you know and re-testing if necessary.

Listen to your lungs

Raising awareness of breathlessness

In July 2016 we launched *Listen to your lungs*.

The year-long campaign aims to:

- increase awareness that breathlessness can be a symptom of serious illness such as COPD
- encourage people to ask healthcare professionals about their breathlessness

Our team have launched a quick online test based around the MRC breathlessness scale.

So far, 250,000 people have completed the test!

Get involved and try the test for yourself here **blf.org.uk/ltyl**

PCRS-UK National Primary Care Conference 2017

Beyond the respiratory consultation: inspiring lifelong change

29-30th September 2017
Telford International Centre

Francesca Robinson, *PCRS-UK Communications Consultant*

The 2017 PCRS-UK annual conference – *'Beyond the respiratory consultation: inspiring lifelong change'* – will explore how we can work with patients in the consultation to help them bring about long-term sustainable improvements, not only in their respiratory condition but also their overall health and wellbeing, through active participation in their care.

Supported by our conference partners – Asthma UK, the British Lung Foundation (BLF) and Education for Health – the event will give delegates an insight into the resources that are available to help patients achieve lasting health improvements.

> *"This conference is always stimulating and I always go back to my practice feeling inspired"*
>
> Fiona, practice nurse.

Dr Katherine Hickman, a GP and member of the Conference Organising Committee, explains: "We usually only see our patients once or twice a year so when we talk about inspiring lifelong change it means thinking about how we can support our patients to build on their own skills and take advantage of the resources such as pulmonary rehabilitation, singing groups or support groups, that are available to help them to manage their condition themselves. We also need to be able to equip them with the knowledge to recognise what is their baseline health, what is normal for them, what they can cope with and when things start going wrong what they need to do about it – can they manage at home, when do they need to see their GP or nurse and when do they need to go to A&E?"

The conference offers keynote plenary presentations, patient-centred clinical updates, key service development and commissioning sessions, research presentations and practical workshops.

Martin Marshall, a GP and Professor of Healthcare Improvement at University College London and an expert in improvement science, will set the scene in the keynote plenary, presenting the evidence for what works in terms of bringing about sustainable behavioural change beyond the consultation, how clinicians can embed this innovation in their daily practice, make efficient use of resources and work in a smarter way.

Clinical symposia

Patient-centred clinical symposia will give clinicians an opportunity to update, consolidate and expand their current knowledge and hear about new developments that will enable them to improve patient care.

The clinical sessions cover a range of essential respiratory topics and focus on the importance of making an early and accurate diagnosis. This theme runs throughout the clinical component of the conference and also features in the very popular Grand Round, which will discuss misdiagnosis, missed diagnosis and missed opportunities.

> *"This conference gives you a chance to stand back from your practice and hear what other people are doing"*
>
> **Sharron, respiratory nurse specialist.**

The clinical stream covers:

- *Debate: Asthma diagnosis, monitoring and management, does fractional exhaled nitric oxide (FeNO) testing have a role?* With multiple asthma guidelines available, there remains the potential for confusion among health professionals. This session will take a look at the sometimes controversial role FeNo testing takes in the journey of an asthmatic patient from diagnosis through to monitoring.
- *Interstitial lung disease (ILD), is it on your radar?* How to recognise, refer and manage your patients appropriately. The symptoms of ILD are easily confused with the symptoms of more common diseases, particularly COPD and heart failure. ILD is not often seen in primary care and a diagnosis can be challenging for physicians who rarely encounter it. As primary care physicians we play a key role in facilitating the diagnosis of ILD by referring patients with concerning symptoms to secondary care. Learn how to make sure we don't forget about ILD.
- *Cough and spit – bronchiectasis or chronic bronchitis; which is it?* It can be easy to mistake one condition for the other and it's so important to not only get the diagnosis right from the outset but also to have the confidence to question the diagnosis when it doesn't quite add up.
- *Respiratory infections – let's talk about antibiotics, right time, right person, right place*. Antibiotics are some of our most precious medicines and we need to start respecting them. Learn how to use them correctly and safely in our respiratory patients so the right ones get the right treatment.
- *Breathlessness: whose patient is it?* Diagnosing your breathlessness patient can be confusing and so often it can be difficult to know where to start or who to refer to.
- *How sick is the child? Croup, bronchiolitis and paediatric respiratory infections – when to refer?* This session will look at common paediatric respiratory infections and how to recognise when the child needs to be managed in secondary care.

Katherine Hickman says: "This year we have ensured there is a strong clinical approach to sessions and a focus on getting the basics right, how to get the diagnosis and the management of respiratory disease correct and how to interpret the different guidelines out there which can be so confusing. There are also sessions about the less common respiratory conditions such as interstitial lung disease and bronchiectasis which we see in our day-to-day practice and need to have on our radar. The PCRS-UK conference provides a lot of clinical learning that delegates can take back to their practices and share with their colleagues. It is also a safe environment where delegates can raise questions with the experts."

> *"The presentations reinforce current practice and make me think a bit deeper about the way I work and how I deliver the service I do, it's really empowering. I have picked up lots of ideas to take back to my community team"*
>
> **Lisa, respiratory specialist nurse.**

Interactive workshops

The hands-on interactive workshops, run in conjunction with Education for Heath, have been so popular in previous years that the number of sessions has been doubled for 2017.

Anne Rodman, independent advanced respiratory nurse specialist, Education for Health trainer and member of the Conference Organising Committee, says: "The topics fit with the conference theme and reflect a need to revisit the basics of care and reinforce skills for practice. Our delegates want to know not just what to do but how to do it in a practical way."

The workshops cover:

- *Pulmonary rehabilitation (PR)*: This is a value-based intervention but the recent report from the primary care workstream of the COPD National Audit[1] showed that significant numbers of people who would benefit from it are not being referred. This workshop will allow participants to experience what goes on in a PR session and help clinicians to understand why it is important to refer patients.
- *The chest examination*: This workshop will teach delegates who have not had much training in this area to understand what they are listening for and how this investigation can add value to the consultation.
- *Inhaler technique*: Understanding how inhalers work and being able to show patients how to use them using a structured approach is essential to help patients manage their respiratory condition better after they leave the surgery.
- *Oxygen therapy and non-invasive ventilation (with input from a patient)*: This will help delegates understand what it is like to experience non-invasive ventilation including trying the equipment themselves, and to better explain to patients about the opportunities and limitations of these therapies.
- *Cognitive behavioural therapy*: This session will help delegates learn skills in non-pharmacological techniques for managing breathlessness.
- *How to read and understand a clinical paper*: Learning how to appraise research is an invaluable skill which will equip delegates to look in more depth at the evidence that underpins guidelines or get involved in further study.
- *Spirometry interpretation*: The session will give delegates an update and the knowledge to understand whether a spirometry report meets quality criteria and how it relates to their patient's respiratory health.
- *FeNO testing*: NICE has been investigating

fractional exhaled nitric oxide testing as a tool to help diagnose asthma in adults and children. Would your practice benefit from introducing it?

Service development stream

These sessions are designed to inspire both clinicians and commissioners to take ideas back to their locality. Delegates in this stream will hear about practical and workable services that are working well and could be reproduced in a practice or across a CCG. Topics reflect current initiatives to improve care in innovative ways.

> *"This is a great conference for keeping up-to-date and consolidating what you know about respiratory medicine. The speakers are well informed, there is lots of data and research and key messages to take home"*
>
> **Richard, GP, respiratory medicine**

Katherine Hickman says: "These sessions about sharing good practice. The best conversations often happen after these sessions because speakers will be keen to share their ideas further with delegates and continue the dialogue by email."

PCRS-UK Chair Dr Noel Baxter says: "Guidelines and primary research tell us what we should do to improve outcomes and, in the real world, budgets and resources determine what we can do. This conference stream will inspire you to make the case to your manager, finance officer or other decision maker about how to realise value-based healthcare for patients and the NHS which by definition will ensure you are doing the right thing."

Sessions cover:

- Which COPD guideline should we use locally? Hear how in Birmingham and in an STP area in London they reached a consensus on COPD management.
- A debate on where spirometry should be done. Hospital or GP surgery? Representatives from the Association for Respiratory Technology and Physiology and the RCGP will discuss some practical ideas for how the new scheme to support the training and competency assessment of those performing and/or interpreting diagnostic spirometry can be implemented.
- How should respiratory services be organised to manage the national obesity problem? A GP tells us how to run a sleep apnoea service from primary care.
- Learning from the national COPD audit. Using the data to improve the quality of diagnosis and access to high value interventions. Learn about the approach from the Respiratory Health Improvement Group for Wales.
- Working differently with people in the new models of care. How to do group consultations and set up an informal COPD clinic that fits with the way people want to experience care.
- Taking breathlessness support services out of hospital and making good breathlessness symptom support the routine.

***Npj Primary Care Respiratory Medicine* research stream**

This stream showcases the cutting edge of primary care respiratory medicine across all aspects of diagnosis, management and service development.

> *"I keep an 'ideas page' in my notebook and add to it whenever I hear about something I could implement at work because the content at this conference is so full of practical stuff that is really relevant to my job"*

The stream combines oral presentations and poster sessions and will include time for questions and discussion with the researchers. Abstract submissions are invited under categories of both original research and 'best practice', which covers audit or assessing a new service or way of working. We particularly encourage submissions of work in progress and from those less experienced in research: this stream is a friendly environment in which to receive feedback from colleagues and more expert researchers.

> *"It was really good to have some people from secondary care around – they give a useful perspective and we don't often get the chance to hear from them when back at work"*

Dr Helen Ashdown, PCRS-UK Research Lead, says: "Research and audit are the foundations for improving future respiratory care, and this stream provides the opportunity to share this work and to receive input and feedback from colleagues around the UK. This stream always generates lively discussion, and is particularly valuable for networking and the sharing of innovative new ideas. There is usually a great mix of small-scale audits alongside large multicentre research studies and there is something for everyone to take back to implement in their own practice."

Innovation: Dragon's Den

The PCRS-UK respiratory community always has some fun at the annual conference and this year this will be provided by a Dragon's Den session in which three intrepid clinicians will pitch a respiratory innovation to a panel of experts. The product pitches are FeNO testing, the RightBreathe App and Breath Easy singing groups.

"The three people who have volunteered to pitch are not afraid to speak their minds so this will no doubt be a feisty session focusing on the benefits to patients," says Anne Rodman.

Something for everyone

The conference offers something for everyone with a passion for high quality respiratory care, with sessions geared both for newcomers and those at the top of their game. Healthcare professionals from every discipline are welcome: GPs, nurses, specialists from secondary care, physiotherapists, pharmacists, researchers and commissioners – anyone who works with respiratory patients.

10 reasons to attend this conference:

- This is the premier respiratory conference for primary and community care which has the needs of patients at its heart.
- It focuses exclusively on respiratory disease and the overall health and wellbeing of patients.
- You will learn from the experts and this event will contribute to your CPD portfolio.
- You will hear about the latest developments in respiratory medicine which will enable you to improve the lifelong care of your patients.
- It caters for a range of learning styles and there are opportunities for hands-on learning.
- You will be inspired to give holistic care to your patients by actively participating in their care and helping them to achieve long-term sustainable improvements.
- This is an opportunity to network with like-minded professionals and leaders in the respiratory field.
- You will make friends: this conference is renowned for being friendly and welcoming.
- It is held in a centrally located conference centre in Telford with easy access via road, train and air.
- It is excellent value for money: with fees starting at just £149 for nurses/allied health professionals and £249 for GPs who are PCRS-UK members. Book early to bag the early bird rate.

For further information and to register visit https://pcrs-uk.org/annual-conference

> *"Had fabulous time, knowledge expanded every minute of each session. Can't wait to disseminate to colleagues"*
>
> **Tweet from Hayley**

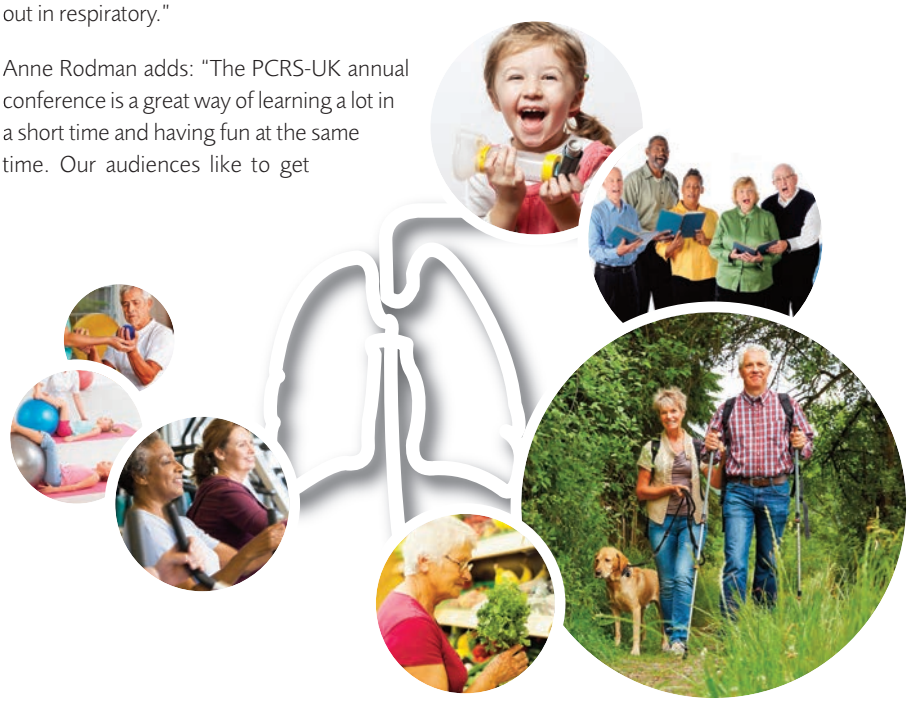
> *"Back home after a great time at PCRS-UK conference. Brain hurts with all the learning and new ideas!"*
>
> **Tweet from Laura**

Alongside the four main streams of the conference there will be a range of high quality satellite sessions developed in conjunction with our pharmaceutical company partners looking further at the management of COPD and asthma.

Katherine Hickman says: "This conference is dedicated to respiratory medicine and to inspiring delegates to raise the profile of respiratory care back in their practice or CCG and to put it on equal footing with other conditions. PCRS-UK never settles for substandard care for patients with asthma and COPD. This is a friendly, safe environment and caters for everybody – it pushes people intellectually but also nurtures people who are just starting out in respiratory."

Anne Rodman adds: "The PCRS-UK annual conference is a great way of learning a lot in a short time and having fun at the same time. Our audiences like to get involved and ask questions and this year we have the conference app for the first time to help them do this. We will be featuring audience interaction again in some of the sessions because we learn more when we participate rather than being passive receivers of information."

"Another strength of conference is the chance to network and catch up with others in the respiratory community. We look forward to welcoming new faces every year to our respiratory family."



Reference

1. Royal College of Physicians. Time to take a breath. National COPD Primary Care Audit Snapshot audit report for Wales in 2014–15. https://www.rcplondon.ac.uk/projects/outputs/primary-care-time-take-breath

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Fostair 100/6 and 200/6 Prescribing Information

Please refer to the full Summary of Product Characteristics before prescribing. **Presentation:** Each Fostair pressurised metered dose inhaler (pMDI) 100/6 dose contains 100 micrograms (mcg) of beclometasone dipropionate (BDP) and 6mcg of formoterol fumarate dihydrate (formoterol). Each Fostair pMDI 200/6 dose contains 200mcg of BDP and 6mcg of formoterol. Each Fostair NEXThaler 100/6 dry powder inhaler (DPI) dose contains 100mcg of BDP anhydrous and 6mcg of formoterol. Each Fostair NEXThaler 200/6 DPI dose contains 200mcg of BDP anhydrous and 6mcg of formoterol. **Indications:** *Asthma:* Regular treatment of asthma where use of an inhaled corticosteroid/long-acting beta$_2$-agonist (ICS/LABA) combination is appropriate: patients not adequately controlled on ICS and 'as needed' (prn) short-acting beta$_2$-agonist; or patients already adequately controlled on both ICS and LABA. **COPD (Fostair 100/6 only):** Symptomatic treatment of patients with severe COPD (FEV$_1$ <50% predicted normal) and a history of repeated exacerbations, who have significant symptoms despite regular therapy with long-acting bronchodilators. **Dosage and administration:** For inhalation in adult patients (≥ 18 years). *Asthma:* **Maintenance And Reliever Therapy (Fostair pMDI 100/6 only)** taken as a regular maintenance treatment and prn in response to asthma symptoms: 1 inhalation twice daily (bd) plus 1 additional inhalation prn in response to symptoms. If symptoms persist after a few minutes, an additional inhalation is recommended. The maximum daily dose is 8 inhalations. Fostair pMDI 100/6 may also be used as maintenance therapy (with a separate short-acting bronchodilator prn). Fostair pMDI 200/6 and NEXThaler (100/6 and 200/6) should be used as maintenance therapy only. Maintenance therapy: Fostair pMDI and NEXThaler 100/6: 1–2 inhalations bd. Fostair pMDI and NEXThaler 200/6: 2 inhalations bd. The maximum daily dose is 4 inhalations. Patients should receive the lowest dose that effectively controls their symptoms. *COPD* **(Fostair 100/6 only):** 2 inhalations bd. Fostair pMDI can be used with the AeroChamber Plus® spacer device. BDP in Fostair is characterised by an extrafine particle size distribution which results in a more potent effect than formulations of BDP with a non-extrafine particle size distribution (100mcg of BDP extrafine in Fostair are equivalent to 250mcg of BDP in a non-extrafine formulation). When switching patients from previous treatments, it should be considered that the recommended total daily dose of BDP for Fostair is lower than that for non-extrafine BDP containing products and should be adjusted to the needs of the individual patient. However, patients who are transferred between Fostair NEXThaler and Fostair pMDI do not need dose adjustment. **Contraindications:** Hypersensitivity to the active substances or to any of the excipients. **Warnings and precautions:** Use with caution in patients with cardiac arrhythmias, aortic stenosis, hypertrophic obstructive cardiomyopathy, ischemic heart disease, severe heart failure, congestive heart failure, occlusive vascular diseases, arterial hypertension, severe arterial hypertension, aneurysm, thyrotoxicosis, diabetes mellitus, pheochromocytoma and untreated hypokalaemia. Caution should also be used when treating patients with known or suspected prolongation of the QTc interval (QTc > 0.44 seconds). Formoterol itself may induce QTc prolongation. Potentially serious hypokalaemia may result from beta$_2$-agonist therapy and may also be potentiated by concomitant treatments (e.g. xanthine derivatives, steroids and diuretics) and increase the risk of arrhythmias. Formoterol may cause a rise in blood glucose levels. Fostair should not be administered for at least 12 hours before the start of anaesthesia, if halogenated anaesthetics are planned as risk of arrhythmias. Use with caution in patients with pulmonary tuberculosis or fungal/viral airway infections. Increase in pneumonia and pneumonia hospitalisation in COPD patients receiving ICS. Clinical features of pneumonia may overlap with symptoms of COPD exacerbations. Fostair treatment should not be stopped abruptly. Treatment should not be initiated during exacerbations or acutely deteriorating asthma. Fostair treatment should be discontinued immediately if the patient experiences a paradoxical bronchospasm. Systemic effects: Systemic effects of ICS may occur, particularly at high doses for long periods, but are less likely than with oral steroids. These include Cushing's syndrome, Cushingoid features, adrenal suppression, decrease in bone mineral density, cataract and glaucoma and more rarely, a range of psychological or behavioural effects including psychomotor hyperactivity, sleep disorders, anxiety, depression and aggression. Prolonged treatment with high doses of ICS may result in adrenal suppression and acute adrenal crisis. Lactose contains small amounts of milk proteins, which may cause allergic reactions. **Interactions:** Beta-blockers should be avoided in asthma patients. Concomitant administration of other beta-adrenergic drugs may have potentially additive effects. Concomitant treatment with quinidine, disopyramide, procainamide, phenothiazines, antihistamines, monoamine oxidase inhibitors (MAOIs) and tricyclic antidepressants can prolong the QTc interval and increase the risk of ventricular arrhythmias. L-dopa, L-thyroxine, oxytocin and alcohol can impair cardiac tolerance towards beta$_2$-sympathomimetics. Hypotensive reactions may occur following co-administration with MAOIs including agents with similar properties (e.g. furazolidone, procarbazine). Concomitant treatment with xanthine derivatives, steroids or diuretics may potentiate a possible hypokalaemic effect of beta$_2$-agonists. Hypokalaemia may increase the likelihood of arrhythmias in patients receiving digitalis glycosides. Presence of ethanol may cause potential interaction in sensitive patients taking metronidazole or disulfiram. **Fertility, pregnancy and lactation:** Fostair should only be used during pregnancy or lactation if the expected benefits outweigh the potential risks. **Effects on driving and operating machinery:** Fostair is unlikely to have any effect on the ability to drive and use machines. **Side effects:** *Common:* pneumonia (in COPD patients), pharyngitis, oral candidiasis, headache, dysphonia, tremor. *Uncommon:* influenza, oral fungal infection, oropharyngeal candidiasis, nasopharyngitis, oesophageal candidiasis, vulvovaginal candidiasis, gastroenteritis, sinusitis, rhinitis, granulocytopenia, allergic dermatitis, hypokalaemia, hyperglycaemia, hypertriglyceridaemia, restlessness, dizziness, otosalpingitis, palpitations, prolongation of QTc interval, ECG change, tachycardia, tachyarrhythmia, atrial fibrillation, sinus bradycardia, angina pectoris, myocardial ischaemia, blood pressure increased, hyperaemia, flushing, cough, productive cough, throat irritation, asthmatic crisis, exacerbation of asthma, dyspnoea, pharyngeal erythema, diarrhoea, dry mouth, dysgeusia, dysphagia, burning sensation of the lips, nausea, dysgeusia, pruritus, rash, hyperhidrosis, urticaria, muscle spasms, myalgia, C-reactive protein increased, platelet count increased, free fatty acids increased, blood insulin increased, blood ketone body increased, blood cortisol decreased, oropharyngeal pain, fatigue, irritability, cortisol free urine decreased, blood potassium increased, blood glucose increased, ECG poor r-wave progression. *Rare:* ventricular extrasystoles, paradoxical bronchospasm, angioedema, nephritis, blood pressure decreased. *Very rare:* thrombocytopenia, hypersensitivity reactions, including erythema, lips, face, eyes and pharyngeal oedema, adrenal suppression, glaucoma, cataract, peripheral oedema, bone density decreased. *Unknown frequency:* psychomotor hyperactivity, sleep disorders, anxiety, depression, aggression, behavioural changes (Refer to SPC for full list of side effects). **Legal category:** POM **Packs and price:** £29.32 1x120 actuations **Marketing authorisation (MA) Nos:** PL 08829/0156, PL 08829/0175, PL 08829/0173, PL 08829/0174 **MA holder:** Chiesi Ltd, 333 Styal Road, Manchester, M22 5LB. **Date of preparation:** Jul 2016. 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Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard. Adverse events should also be reported to Chiesi Ltd on 0161 488 5555.

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asthma UK

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The impact of a late diagnosis of bronchiectasis

Francesca Robinson talks to **Barbara Preston**, a member of the PCRS-UK Lay Patient and Carer Reference Group, about how a missed diagnosis of bronchiectasis has affected her

Barbara Preston, aged 73, was diagnosed with bronchiectasis in her early twenties but believes she developed the condition when she was three years old as a result of a bout of double pneumonia.

Throughout her childhood she suffered from a persistent cough, particularly in the winter, endured frequent respiratory infections and was generally regarded as 'delicate'. "My mother hardly ever took me to the doctor because I don't think she saw much point. In retrospect I think she was probably right, because all they did was give me cough medicine and told me I would grow out of it," says Barbara.

At the age of 17, on the third visit to her GP because of a persistent respiratory infection, she was referred for a chest X-ray. She was told she had 'congestion of the lungs' and was given antibiotics for the first time and told to go to bed. She was taught postural drainage, which she says provided some relief, but she remembers coughing for weeks afterwards.

During her second year at university Barbara had an ongoing respiratory infection with haemoptysis and visited the GP several times. Eventually he sent her for a TB test which came back negative. She was given antibiotics but still did not improve.

In 1964 when Barbara, now aged 20, went home for the summer, and still struggling with a respiratory infection, went to see her local GP who referred her to King's College Hospital, recommending an operation 'to cut out the bad bits'. While in hospital she had a bronchoscopy and a bronchogram and was finally given a diagnosis of bronchiectasis. She was told it was not advisable to operate because too much of her lungs were damaged. In those days the treatment was postural drainage and occasional antibiotics, although there was no sputum testing.

Although some GPs were supportive, it was really self-management by default and it was only from the 1990s onwards that Barbara says she began to gain more control over her disease when she met a GP who treated her as a partner in her care. She was given a rescue pack of antibiotics for the first time and a sputum testing kit.

Barbara says it did help to eventually receive a diagnosis, but feels that 50 years ago they did not really know how to diagnose and treat bronchiectasis. She says care can still be patchy: "As late as 2006, on changing practices, I found they didn't want to give me antibiotics unless I had a temperature but I can have an infection without a temperature – that's quite normal for people with bronchiectasis. They would only give me seven days' worth of antibiotics whereas now they give me 14 and you had to wait to see a doctor to prove you were ill enough to need them."

The main impact of the late diagnosis of bronchiectasis on Barbara was a childhood blighted by regular illness. She now has severe osteoporosis in her spine and was told by a consultant that this could be a result of her bones not developing strongly during childhood because she was ill so frequently.

The lack of a correct diagnosis resulted in Barbara having many GP and hospital appointments at an additional cost to the NHS. Poor understanding of how to treat bronchiectasis in the past has led to Barbara taking many courses of antibiotics, not only an unnecessary cost but also an issue for antimicrobial resistance.

Barbara is sanguine: "I'm sure that I could have had better health throughout my life if I had had an earlier diagnosis, but possibly that was due to a poor understanding of this disease in the past."

"Currently I'm fitter than I have ever been. Now the medication they give you is much more effective, whilst gradually gaining the knowledge to self-manage makes an enormous difference to my quality of life. I take one antibiotic three times a week, have been doing so for three years and now have very few infections. For many years I used to take eight or nine courses of antibiotics but more recently I have managed nearly a year without a full course, which is an all-time record. I am colonised by Pseudomonas, but it's under control."

Could anything have been done differently? "I would like to give the doctors the benefit of the doubt because I think 70 years ago they didn't understand bronchiectasis as well as they do now," says Barbara.

She adds: "Now there is no excuse; the British Thoracic Society has developed a pathway of support and we are beginning to get consultants who specialise in bronchiectasis. However, healthcare practitioners must work in partnership with their patients as, in the end, living with bronchiectasis is all about self-management. Modern medication is extremely helpful, but it's down to the patient to learn when and how to take it, keep up their chest clearance exercises and live as active and healthy a life as they can manage."

Jane Scullion, PCRS-UK Trustee and Respiratory Nurse Consultant, comments: "Missed diagnosis remains problematic both for patients and healthcare professionals, and this article is a timely reminder that we should always consider alternative diagnoses and responses to our treatments."

Noel Baxter, GP and PCRS-UK Chair comments: "Differentiating between COPD and bronchiectasis or recognising that a difficult to control asthma now has a bronchiectasis component is still a challenge today. National and international guidelines in respiratory disease can often provide the directness and focus for interventions, but when it comes to a diagnosis, there is less clarity and clinical suspicion and weighing up the evidence provided by the individual is still the greater part of getting it right. A patient with greater 'activation' and knowledge and a diagnostician who gives time to and listens out for their ideas and concerns is the partnership that is most likely to help us get earlier diagnosis."

Lay Reference Group Member Profile

Name: Barbara Preston
Barbara, aged 73, lives in Nottingham

What condition do you suffer from?
Bronchiectasis

When were you diagnosed?
I wasn't officially diagnosed with a bronchogram until I was 20 but I had probably had the condition since I was three. Nobody recognised it in those days; I was just told to go away, take cough medicine and I would grow out of it.

What has made most difference to you in terms of your care?
Being able to self-manage. GPs (and now my consultant) gradually began to trust me and provide a rescue pack and sputum testing kit so I don't have to waste time getting an appointment. This makes me feel as though I am in control and can keep on top of things. I'm very active in my local Breathe Easy group and I work hard to look after myself through exercise, diet, etc.

Why were you interested in joining the lay reference group?
Because lung disease is a bit of a Cinderella – and particularly bronchiectasis – in the public's eye, and yet so many people's lives are affected by it. There needs to be greater awareness that more could be done not just amongst the public but also among the medical profession. The quality of care is very patchy across the country, so I think it's really important to give the patient perspective and try to support PCRS-UK's important work. Plus it's all very interesting.

What messages would you like health professionals to hear?
I would like them to really understand the importance of supporting patients in achieving self-management. Most patients are capable and want to have control over their health and have a better quality of life. But it isn't necessarily a quick fix. I see newly diagnosed patients come along to our Breathe Easy group feeling angry, depressed and helpless. But gradually, as they become better educated, they learn to take control so they both save the NHS money and achieve a better quality of life, becoming much happier at the same time. I believe it's really important that patients and healthcare professionals work together.

Peak flow monitoring and microspirometry as aids to respiratory diagnosis in primary care

Dr Duncan Keeley Executive Committee Member, PCRS-UK

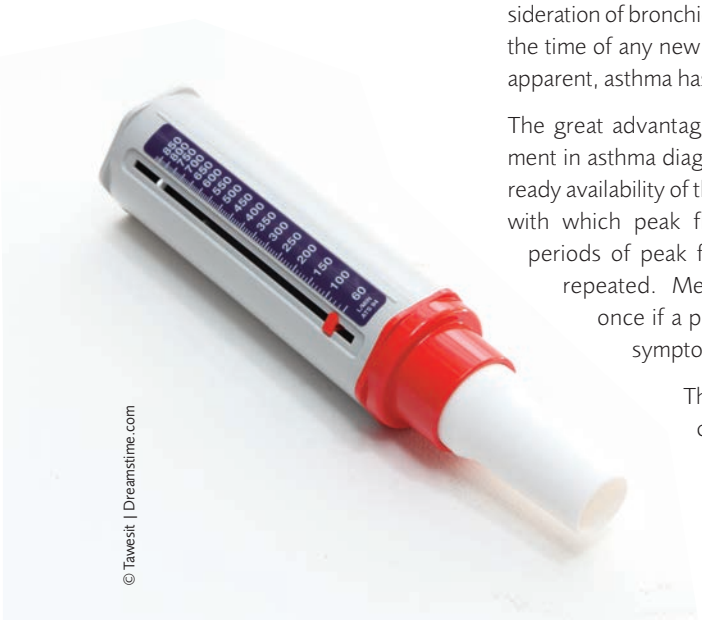
Introduction

The common chronic respiratory disorders diagnosed in primary care – asthma and COPD – are both characterised by airways obstruction. In asthma this varies markedly with time and treatment while in COPD the airways obstruction is typically fixed and permanent. Some people have fixed obstruction with some degree of reversibility – the so-called 'asthma COPD overlap syndrome'.

Diagnosis involves careful history taking and examination before moving on to physiological testing – being careful to keep in mind other respiratory and non-respiratory diagnoses that may cause breathlessness or cough. The pattern of symptoms over time and their response to treatment is also important, and earlier diagnoses should be re-interrogated if necessary. Always review an initial diagnosis – and consider referral to a specialist – if response to treatment is poor or there are atypical features. Chronic sputum production, for example, is highly unusual in asthma and even in COPD should prompt consideration of bronchiectasis. Get a chest X-ray at the time of any new diagnosis of COPD and, if apparent, asthma has definite atypical features.

The great advantages of peak flow measurement in asthma diagnosis are the low cost and ready availability of the equipment and the ease with which peak flow measurement – and periods of peak flow monitoring – can be repeated. Measurements can start at once if a patient presents with acute symptoms.

This article will cover the use of peak flow monitoring and microspirometry in primary care as aids to the objective demonstration of airways obstruction – reversible or otherwise.



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Peak flow monitoring

Repeated measurement and charting of peak expiratory flow has long been used for the diagnosis of asthma. Like many long established and simple aids to diagnosis, the published evidence base for its use is surprisingly sparse: a recent NICE assessment for a draft guideline on asthma diagnosis[1] cites a generally low and variable sensitivity but a specificity of up to 0.99 in adults and 0.80 children for peak flow monitoring in the diagnosis of asthma. This high specificity ('negativity in health') does mean, however, that clear evidence of peak flow variability is very good for ruling asthma in as a diagnosis, while sensitivity ('positivity in disease') improves if the monitoring is repeated – particularly across a period of exacerbation and remission of symptoms.

Who should do this?

Setting up peak flow monitoring with a patient suspected of having asthma requires the health professional to have the skills and the time to do it. Just like correct use of an inhaler, teaching correct use of a peak flow meter is not like falling off a log and a surprising number of health professionals don't know how to do it. Learn – it is

not rocket science either! Explaining and teaching effective peak flow monitoring does take a bit of time, but attention to correct diagnosis at the outset saves a great deal of time down the line. If there is not time to do the job at the first consultation, bring the patient back as soon as possible to go over it more thoroughly – but always get at least one peak flow and give them a meter and a chart before starting any treatment.

How to do it

Effective peak flow monitoring for diagnosis depends on:

1. Explaining to the patient or parent how valuable a period of peak flow monitoring is in helping to make a correct diagnosis. "This is a bit of a palaver but it will really help us to get the right diagnosis and get you on to the right treatment to get you better."
2. Correct teaching of how to use the peak flow meter. Best of three hard fast blows and record the highest reading.
3. Having the patient or parent show you that they can perform peak flow measurements, correctly read the meter and correctly plot that number on a chart. They must be able to do all three to make a meaningful peak flow chart.
4. Taking measurements twice daily or more for a sufficient period – usually at least 2-4 weeks – at a time when symptoms are present. Peak flow charting when introducing a trial of treatment is particularly worthwhile. Encourage measurement when symptoms are marked and when they are better. Pre- and post-exercise readings are also useful.
5. Knowing how to identify abnormal variability in peak flow.
6. Repeating the testing period at a later date if symptoms persist but initial testing is inconclusive or the diagnosis remains in doubt.

Peak expiratory flow (PEF) should be recorded as the best of three forced expiratory blows from total lung capacity with a maximum pause of 2 seconds before blowing. The patient can be standing or sitting. Further blows should be done if the largest two PEF measurements are not within 40 L/min.

Charts are provided with peak flow meters but these are limited in duration. Drug companies provide peak flow diaries or you can use the excellent charts in the booklet FP1010, often still available from primary care organisations. Charting the readings on a graph is much preferable to recording numbers only, since it allows better pattern recognition and easier identification of maximum and minimum readings. Electronic meters with memory recording exist but are little used outside of research settings.

The age at which children become able to do reliable peak flow measurements cannot be easily defined, but most children aged 7 years and over will be able to perform meaningful peak flow measurements. Children should be given a low range peak flow meter.

If you are seeing a patient with acute wheezing that you are planning to treat with high-dose bronchodilators and/or oral corticosteroids, always measure peak flow before and after treatment; this is good practice in any case as part of the assessment of severity of the attack and may afterwards provide strong supportive evidence for an asthma diagnosis.

The brilliant Form FP1010 contains 32 weeks' worth of PEFR charts, instruction for use and care of the peak flow meter and has space at the back for a written personal action plan

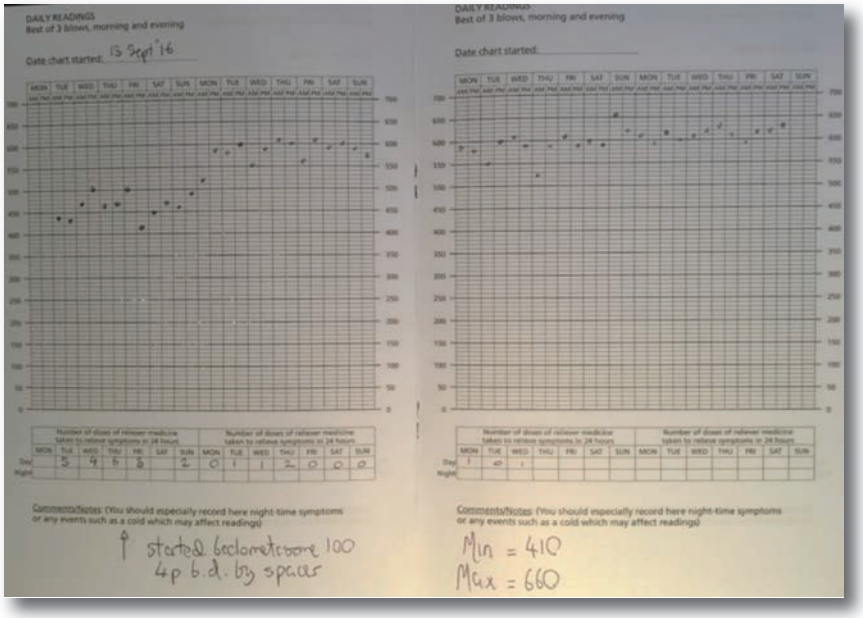
'Poor compliance'

It is often said that compliance with peak flow charting is poor. In my experience this is not true if the method, purpose and value of the charting is clearly explained and it is made clear that charting does not need to continue once the diagnosis is made. Discussions of peak flow monitoring also sometimes refer to falsification of peak flow records – usually to conceal the fact that the measurements have not actually been done. Again, what is needed is a patient and trusting relationship between health professional and parent or patient. This allows effective explanation of the importance of doing what has been asked, and of being honest if it has not been possible to do this for whatever reason. With experience it is often easy to tell that a record has been made up – and gently share this possibility with the patient. A miniscule number of patients may deliberately falsify a record to make it appear that they have asthma when they do not. This can be hard to detect but is vanishingly rare, and far more likely to be found in tertiary referral settings than in primary care.

What is abnormal peak flow variability?

There are a variety of numerical definitions. Like blood pressure and blood glucose, peak flow variability is a continuous physiological variable and cut-off points are arbitrary. One commonly used definition (cited in the BTS/SIGN guideline[2]) is the difference between maximum and minimum expressed as a percentage of the mean peak flow, with more than 20% being considered abnormal. If the max–min difference is greater than 20% of the maximum reading (easier to find than the mean), then this is clearly abnormal.

As helpful as the numbers is the appearance pattern of the graph. The most typical picture is of low readings with obvious saw tooth



Two-week peak flow tracing consistent with a diagnosis of asthma: a picture is worth a thousand words

variability flattening out and rising as symptoms respond with time or treatment.

The illustration above shows the peak flow chart of a 55-year-old never smoker with a 1-year history of recurrent worsening cough and shortness of breath. His chest X-ray was normal. His symptoms had greatly improved with a 1-week course of prednisolone but recurred when the steroids were stopped. The chart was done as he started on twice daily inhaled corticosteroids by spacer. It provides convincing objective evidence of significant peak flow variability coinciding with resolution of his symptoms. This is strongly supportive of an asthma diagnosis.

Remember occupational asthma

The possibility of occupational asthma should be borne in mind whenever you make a new asthma diagnosis in an adult. In addition to careful history taking around occupation and symptoms, a period of peak flow charting indicating when the patient is at work is vital. Patients in whom occupational asthma is suspected should be referred for specialist assessment but should chart their peak flow until seen. See http://www.occupationalasthma.com/ for more information on occupational asthma

Does peak flow monitoring have any place in the diagnosis of COPD?

Peak flow measurement is not adequate for COPD diagnosis. This requires quality-assured diagnostic spirometry in addition to a full clinical assessment. But asthma can develop at any age and, if late onset asthma (or COPD with a substantial reversible component) is suspected, then peak flow charting in addition can be valuable and provide additional useful diagnostic information.

Do patients with asthma need to continue to monitor their peak flow?

Usually not. But it is worth them keeping their peak flow meter and knowing their best and lowest readings as restarting peak flow measurements may be found useful for some people as part of a personal asthma action plan. Most patients with asthma can effectively self-manage based on symptoms alone – but some people are slow to recognise significant deteriorations ('poor symptom perceivers') and such people may find regular peak flow checking helpful.

Microspirometry

Simple inexpensive hand-held spirometers, programmed at each use with the patient's age, height and gender, can give good accurate readings of forced expiratory volume in 1 second (FEV_1) and express this as percent predicted. The patient is asked to perform a forced vital capacity type manoeuvre – as for diagnostic spirometry – but can stop after the 1 second bleep emitted by the spirometer.

It is a simple matter to obtain these measurements before and after treatment of acute symptoms, whether with high-dose bronchodilators or short course oral steroids, although both the necessary expiratory manoeuvre and the correct use of the instrument are more demanding than measurement of peak flow.

These instruments are not a substitute for full diagnostic spirometry in COPD, although they are useful for screening adults – especially symptomatic older smokers – for possible COPD. An FEV_1 of 80% predicted or less should prompt consideration of full diagnostic spirometry. Note that, if COPD is being considered as a diagnosis, then screening or diagnostic spirometry should be done at least 4–6 weeks after the resolution of acute symptoms. If asthma is

suspected, then what is needed is a microspirometry measurement at the time when the patient is symptomatic, with measurement of FEV_1 before and after treatment.

In the assessment of asthma, a rise in FEV_1 of 12% and at least 200 mL with time or treatment is suggestive of asthma. An increase of 400 mL or more in FEV_1 is strongly suggestive of asthma.[2] Here the key difference is that measurements both before and after treatment or resolution of acute symptoms provide the best information.

Conclusion

How to diagnose asthma is a matter of considerable current controversy. Significant concerns have been raised about overdiagnosis – although late diagnosis is still a problem also. The well-established BTS/SIGN guideline, updated in 2016, contains a comprehensive discussion of the approach to diagnosis and recommends spirometry as the preferred test of airways obstruction. A draft NICE guideline on diagnosis and monitoring of asthma, whose publication is currently paused, has suggested a different approach involving FeNO in addition to spirometry for (nearly) all. Both guidelines retain a place for peak flow measurements but relegate these to a subsidiary role. However, spirometry is very often normal in suspected asthma in primary care. The quality of spirometry in primary care is variable and there is a substantial training need if quality assured diagnostic spirometry is to be easily available to all[3] – a highly desirable aim. Peak flow monitoring – cheap, (relatively) simple and easily repeatable – should retain an important role in the diagnosis of asthma and all primary healthcare professionals should know how to teach and use this.

Reference

1. NICE. Asthma: diagnosis and monitoring in adults, children and young people. Draft Clinical Guideline. https://www.nice.org.uk/guidance/gid-cgwave0640/resources
2. British Thoracic Society. BTS/SIGN British guideline on the management of asthma. http://bit.ly/2cKau3U
3. Improving the quality of diagnostic spirometry in adults: the National Register of certified professionals and operators. http://bit.ly/2c6aPKQ

For further information, see centrefold wall chart for more information on diagnostic tests.

Lay Patient and Carer Reference Group: So just how safe are steroids?

Bronwen Thompson reports on a discussion of the Lay Patient Reference Group

That was the question asked by one member of the PCRS-UK Lay Reference Group (LRG) after she attended a session at the 2015 conference where a speaker debated the role of high-dose steroids. She was unaware that questions were being asked about the safety of steroids at high doses, so listened intently and reflected on her own care.

As this was a particular area of interest for the group, we included it on the agenda for the second meeting of the LRG on the day before last year's conference. Jane Scullion, Respiratory Nurse Consultant and Chair of the LRG, and Noel Baxter, GP and Chair of PCRS-UK, led a session to give them information about the role of steroids, highlight areas of clinical debate, and gave the group the opportunity to ask questions.

Most of the group were taking oral steroids or high-dose inhaled steroids. The role, benefits and drawbacks of high-dose inhaled and oral corticosteroids were discussed. Only some of the group had a steroid safety card. Some had never heard of such a card. As some of them were holding steroid tablets for self-administration in the event that their control deteriorated, this was particularly concerning. The frequency of use of these was considered and the fact that bronchodilation is the first step before initiating oral steroids. They felt that, because the risks of taking steroids long term are wide-ranging and serious, it is essential that patients are fully informed and that they understand the consequences of extended usage. They were amazed to hear that it was recommended in 2006 by the Medicines and Healthcare Products Regulatory Agency (MHRA) that every patient on high-dose steroids should carry a safety card and definitely those on oral corticosteroids.

Jane confirmed this and added: "If you take a short course of oral corticosteroids for an exacerbation, you do not need to taper them off but can just take the course. However, you need to be aware that, with longer tem use, you should not stop your steroids abruptly but need to taper them off slowly, as advised by your nurse or doctor. They are really effective in dampening down any flare-ups or exacerbations and can play an important role in many respiratory conditions, but take it slowly when coming off them after long-term use."

The group enjoyed the discussion and left the meeting feeling they would be able to have a better informed discussion with their healthcare professionals in future.

Policy Round-Up

Bronwen Thompson, *PCRS-UK Policy Advisor*

A summary of the latest developments in the UK health services, including any major new reports, guidelines and other documents relevant to primary care respiratory medicine

NICE makes progress on guidelines for asthma

NICE began work in 2013 on a clinical guideline on diagnosis and monitoring of asthma. The publication of this draft guideline in 2015 attracted widespread concern that the prominent role proposed for spirometry and fractional exhaled nitric oxide (FeNO) as diagnostic tools was impractical, unreliable and unlikely to be adopted in practice. PCRS-UK played a significant role here by providing a report based on a member survey and writing to senior people at NICE and NHS England. NICE took the unusual step of halting any further development of the guideline until field testing could be undertaken in a cross-section of practices. For 6 months of last year, selected field testing sites trialled the draft guideline's recommendations for using spirometry and/or FeNO in diagnosis and, by December, they had reported back to NICE on how the guideline's recommendations worked in practice. NICE will review the experience of the testing sites and intends to publish the final guideline in summer 2017.

Meanwhile NICE has also been working on developing a guideline on asthma management. A draft guideline was published at the end of December, and PCRS-UK has been gathering input and developing a response to the consultation. The significant change from the familiar treatment pathway in the BTS/SIGN British Asthma Guideline is that leukotriene receptor antagonists (LTRAs) are recommended as the first-line add-on to low-dose inhaled corticosteroids, whereas it is common practice in line with the BTS/SIGN guideline to use long-acting beta agonists (LABAs) before LTRAs. In most other respects it seems that the guidance from NICE has more similarities than differences from BTS/SIGN. The methodology followed by BTS/SIGN focuses exclusively on effectiveness evidence, whereas NICE looks at cost effectiveness as well as clinical effectiveness, and has concluded that using LTRAs before LABAs will save the NHS a lot of money.

PCRS-UK will continue to be fully engaged with the development of these guidelines and will update the PCRS-UK Asthma Quick Guide with specific guidance for a primary care audience later in 2017 once both pieces of guidance are published. There will be a clinical symposium at our 2017 conference in September at which the NICE asthma guidelines will be debated. We are very grateful to the many members who contribute by giving us their opinions on draft guidance, which then informs our responses to consultations.

COPD guideline updates too!

In February an updated guideline on COPD was released by the Global Initiative for Chronic Obstructive Lung Disease (GOLD). This guideline has come to be relied upon increasingly in the UK since an updated COPD guideline from NICE is now long overdue. The GOLD guideline features a revised and improved ABCD assessment tool, which now places more emphasis on a patient's symptom burden when evaluating disease severity and gives treatment algorithms for each of the four severity stages (where A is better and D is worse). In addition, new recommendations concerning ongoing self-management and education programmes, a more stepwise approach to the use of inhaled corticosteroids and enhanced outpatient transition criteria are presented. The Global Strategy also now recommends the use of inter-professional care management throughout all levels of care, and provides new evidence for pulmonary rehabilitation and palliative care.

Did you know? ...

The Care Quality Commission (CQC) website features a whole range of short pieces of guidance for primary care from Professor Nigel Sparrow, who is CQC's Senior National GP advisor. His 'Tips and mythbusters' include topics such as use of oxygen and oximeters, end of life care, portable appliance testing and calibrating medical equipment, nurse revalidation, practice-based pharmacists. We have heard that a mythbuster on spirometry may be in development and will keep you posted.
http://www.cqc.org.uk/content/nigels-surgery-tips-and-mythbusters-gp-practices-full-list

NICE too is updating their COPD guideline (CG101) which was published in 2010, and a guideline development group will start work in the spring following consultation on the scope of the update. The updated guideline will not be published until November 2018. We shall keep you informed of developments.

UK Inhaler Group continues its quest for optimal inhaler usage

Following the publication of its research paper on blue inhalers in 2016, the UK inhaler group (UKIG) has met with the MHRA to discuss strengthening colour conventions for inhalers. The MHRA is keen to support efforts to improve the safety of inhaler usage, and is also interested in areas such as generic vs branded prescribing of inhalers, and the impact that this may have on whether the patient receives the inhaler device they have been trained to use. In fact, all dry powder inhalers have now been classified as requiring patient training, so should be prescribed by brand name rather than generic name to ensure patients receive the inhaler device the prescriber intended for them. The latest iteration of the BTS/SIGN British asthma guideline also recommends prescribing of inhalers by brand name.

In January, UKIG released a set of standards and competencies for those prescribing and reviewing inhaled medications. A key recommendation is that all healthcare professionals prescribing an inhaler should ensure that the patient knows how to use the device and that they themselves can correctly and clearly demonstrate to the patient and/or carers how to use it. NICE reinforces the importance of this in quality standards for both asthma and COPD on the basis that the patient gets no or reduced benefit from using an inhaler incorrectly. You can view these standards at https://goo.gl/YYR9ZD. In recognition of the importance of teaching and checking inhaler technique routinely, the lead author of these standards, Jane Scullion, will be running two workshop sessions at the PCRS-UK conference in September on inhaler technique.

PCRS-UK will continue to play an active role in UKIG work and to bring a primary care perspective to their work.

A focus on paediatric asthma

In January, the Royal College of Paediatrics and Child Health (RCPCH) made asthma one of five childhood conditions to highlight in its report on 'The State of Child Health'. It reported that the UK has one of the highest prevalence, emergency admission and death rates for childhood asthma in Europe, and that there is wide geographical variation in emergency asthma admission rates across the UK. RCPCH is encouraging full implementation of BTS/SIGN asthma guidelines across the UK and improved asthma education for children, families and healthcare professionals. http://www.rcpch.ac.uk/state-of-child-health/health-conditions

This echoed the findings of the British Thoracic Society's National Paediatric Audit, published in November 2016, which found that children admitted to hospital with severe asthma attacks generally receive 'very effective and efficient' treatment and care. It recommended that a greater level of asthma education and review is needed on discharge from hospital, to help prevent future attacks and readmission to hospital. http://bit.ly/2ifWCCA

Resource to promote improvements in primary care management of COPD

The Royal College of Physicians, which oversees the National COPD audit, has produced a slide set highlighting the key learning from the primary care arm of the audit. These describe the key findings from the audit in Wales, and will create the opportunity to discuss how your practice compares on key parameters of the quality of COPD care that you provide. It also highlights disparities between audit data collected from patients' notes and the QOF data, signalling that there is no cause for complacency in practices with 'good' QOF figures. There is an excellent visual representation of how the COPD value pyramid manifests itself in practice, demonstrating that the most cost effective and high value treatments – such as flu vaccination, smoking cessation and pulmonary rehabilitation – are being used less than some of the most expensive and least cost effective interventions.

Are you certified?

In brief:

- Other recent respiratory guidance includes:
  - NICE Tuberculosis quality standard (QS141)
- Other relevant non-respiratory guidance:
  - Transition from children's to adults' services quality standard (QS140)
- Guidance in development:
  - BTS home oxygen quality standards
  - BTS guidelines for oxygen use in adults in healthcare and emergency settings
  - BTS guideline for the outpatient management of pulmonary embolism
  - NICE prescribing guideline on managing common infections
  - NICE guideline on indoor air pollution
  - NICE quality standard on the care of dying adults
  - NICE quality standard on multimorbidity
  - NICE guidance: Emergency and acute medical care in over 16s: service delivery and organisation

Questions are raised on a regular basis about whether asthma is under- or over-diagnosed, and whether there are missing millions of undiagnosed COPD patients not receiving the care that they need. This always highlights the need to improve the quality of diagnosis of respiratory disease, and spirometry is increasingly central to this subject. It is well established as a diagnostic and monitoring tool for COPD and is increasingly being explored to support a diagnosis of asthma.

PCRS-UK has been involved with other respiratory organisations to support an NHS England-led initiative to raise the standard of spirometry by developing standards and by formalising a scheme whereby healthcare professionals can be certified as competent to perform and/or interpret spirometry. Once certified as competent, they will join a national register of certified practitioners of spirometry, which will be held by the Association for Respiratory Technology and Physiology (ARTP). This scheme will be introduced in April 2017 and phased in over 4 years.

We believe that this scheme will support many nurses who may not have had access to the training they have needed to perform or interpret spirometry to a high standard. Whatever your profession, we encourage everyone involved in providing spirometry to look at the document and consider what they should do to be certified as competent. Those who are experienced at performing or interpreting spirometry can apply to join the national register via the Experienced Practitioner route http://bit.ly/2msdwPQ Also in development is a guide for commissioners on how to commission a spirometry service and we shall update you on this in a future edition.

Journal Round-Up

npj Primary Care Respiratory Medicine Key Summaries

A selection of short summaries of original research articles published in *npj Primary Care Respiratory Medicine*. The articles featured have been selected by the Primary Care Respiratory Update editorial board as being the most relevant and useful to primary care respiratory clinical practice in the UK. You can download freely any articles of interest from the website http://www.nature.com/npjpcrm/

npj Primary Care Respiratory Medicine is the only fully indexed scientific journal devoted to the management of respiratory diseases in primary care. It is an international, online, open access journal and is part of the Nature Partner Journal series.

If you would like to be informed when a new paper is published by *npj Primary Care Respiratory Medicine* simply join the npj Primary Care Respiratory Medicine e-alert list to receive notification direct to your inbox. Visit www.nature.com/npjpcrm/ and click the link on the right titled E-alert.

**** EDITOR'S CHOICE ****

Effect of novel inhaler technique reminder labels on the retention of inhaler technique skills in asthma: a single-blind randomized controlled trial
Iman A Basheti, Nathir M Obeidat & Helen K Reddel
npj Primary Care Respiratory Medicine 27, Article number: 9 (2017)
doi: 10.1038/s41533-017-0011-4

Personalised labels on asthma inhalers remind patients of correct technique and help improve symptoms over time. Iman Basheti at the Applied Science Private University in Jordan and co-workers trialled the approach of placing patient-specific reminder labels on dry powder asthma inhalers to improve long-term technique. Poor asthma control is often exacerbated by patients making mistakes when using their inhalers. During the trial, 95 patients received inhaler training before being split into two groups: the control group received no further help, while the other group received individualised labels on their inhalers reminding them of their initial errors. After 3 months, 67% of patients with reminder labels retained correct technique compared with only 12% of controls. They also required less reliever medication and reported improved symptoms. This represents a simple, cheap way of tackling inhaler technique errors.

Is the 'blue' colour convention for inhaled reliever medications important? A UK-based survey of healthcare professionals and patients with airways disease
Monica Fletcher, Jane Scullion, John White, Bronwen Thompson & Toby Capstick
npj Primary Care Respiratory Medicine 26,
Article number: 16081 (2016) doi: 10.1038/npjpcrm.2016.81

An official colour code system should be introduced for inhaled medication as UK survey results indicate the importance of the blue inhaler. Monica Fletcher at Education for Health in Warwick and colleagues on behalf of the UK Inhaler Group conducted a survey of 596 healthcare professionals and 2,127 patients with airways disease to determine how important coloured labelling is on inhaler medication. Traditionally, the short-acting beta 2 'reliever' inhaler is coloured blue – an unofficial colour-coding system that, as the survey revealed, 89% of patients and 95% of healthcare professionals frequently refer to when discussing medication. With the increase in inhaler types available, there is concern that blue may be used for inhalers not designed for emergency relief, potentially putting patient safety at risk. Fletcher's team therefore call for an official universal colour-coding system for inhaled medication.

First maintenance therapy for COPD in the UK between 2009 and 2012: a retrospective database analysis
David Price, Marc Miravitlles, Ian Pavord, Mike Thomas, Jadwiga Wedzicha, John Haughney, Katsiaryna Bichel & Daniel West
npj Primary Care Respiratory Medicine 26,
Article number: 16061 (2016) doi: 10.1038/npjpcrm.2016.61

Patients newly diagnosed with chronic lung disease are often prescribed inappropriate medication by UK doctors. Current guidelines recommend long-acting inhaled bronchodilators as early treatment to bring the symptoms of chronic obstructive pulmonary disease (COPD)

under control. Inhaled corticosteroids (ICS), by contrast, should only be given to more severely affected patients because they can cause serious side effects, particularly in patients with a history of other illnesses such as pneumonia. A study by David Price at the University of Aberdeen and co-workers has revealed that ICS are often inappropriately prescribed by doctors in the UK. The team analysed data from 2,217 patients, 29% of whom received combined prescriptions including ICS. More worryingly, doctors prescribed ICS as a stand-alone treatment to 15% of patients, a regimen not supported by any guidelines.

'To use or not to use': a qualitative study to evaluate experiences of healthcare providers and patients with the assessment of burden of COPD (ABC) tool
Annerika HM Slok, Mascha Twellaar, Leslie Jutbo, Daniel Kotz, Niels H Chavannes, Sebastiaan Holverda, Philippe L Salomé, PN Richard Dekhuijzen, Maureen P M H Rutten-van Mölken, Denise Schuiten, Johannes CCM in't Veen & Onno CP van Schayck
npj Primary Care Respiratory Medicine 26,
Article number: 16074 (2016) doi: 10.1038/npjpcrm.2016.74

Patients with chronic lung disease respond positively to a new online tool that helps them monitor their own progress and health status. For long-term progressive diseases such as COPD, there is a drive to move from doctor-driven care to guided self-management. Annerika Slok at Maastricht University and co-workers conducted in-depth interviews with 15 healthcare professionals and 21 patients to assess a new online tool, the Assessment of Burden of COPD (ABC), aimed at aiding the transition to patient-centred care. The tool allows patients and doctors to monitor ongoing health status and exacerbation triggers using visual diagrams. Patients and doctors felt ABC provides patients with better insight into COPD, enhances motivation to change key behaviours and triggers more in-depth discussion. Linking ABC to electronic medical records should enhance usability and uptake.

A randomised open-label cross-over study of inhaler errors, preference and time to achieve correct inhaler use in patients with COPD or asthma: comparison of ELLIPTA with other inhaler devices
Job van der Palen, Mike Thomas, Henry Chrystyn, Raj K Sharma, Paul DLPM van der Valk, Martijn Goosens, Tom Wilkinson, Carol Stonham, Anoop J Chauhan, Varsha Imber, Chang-Qing Zhu, Henrik Svedsater & Neil C Barnes
npj Primary Care Respiratory Medicine 26,
Article number: 16079 (2016) doi: 10.1038/npjpcrm.2016.79

Patients should be coached in inhaler technique by trained professionals to eliminate critical errors. Job van der Palen at the University of Twente, with scientists from across the Netherlands and the UK, tested whether 729 patients with asthma and COPD could use various inhalers correctly after reading accompanying instructions. A trained professional observed the patients and corrected critical errors before allowing patients to try the inhalers again. More COPD patients displayed errors in inhaler technique compared with asthma sufferers. The ELLIPTA inhaler proved far easier for patients to use from the outset, meaning they made fewer (if any) critical errors. Both asthma and COPD sufferers preferred the ELLIPTA inhaler to the other inhalers tested. The team emphasise the importance of training in correct inhaler use alongside careful selection of inhaler design.

Development of a validated algorithm for the diagnosis of paediatric asthma in electronic medical records
Andrew J Cave, Christina Davey, Elaheh Ahmadi, Neil Drummond, Sonia Fuentes, Seyyed Mohammad Reza Kazemi-Bajestani, Heather Sharpe & Matt Taylor
npj Primary Care Respiratory Medicine 26,
Article number: 16085 (2016) doi: 10.1038/npjpcrm.2016.85

An algorithm that searches electronic medical records could greatly improve the accurate diagnosis of childhood asthma. Public health initiatives require accurate information regarding disease prevalence, but medical conditions with widely varying symptoms, like asthma, can be difficult to diagnose. Andrew Cave and co-workers at the University of Alberta, Canada, trialled the ability of a newly developed algorithm to accurately identify children with asthma (in Alberta) using a Canada-wide medical record database. They initially reviewed 100 random records and asked experts to independently verify asthma diagnoses. The experts agreed on 97% of cases. The team then tested the algorithm on a further 1000 records. The algorithm proved to be extremely accurate in matching a physician's review of the records, and will provide a useful tool for identifying children in the database requiring more attention or those who have been misdiagnosed.

Opportunities to develop the professional role of community pharmacists in the care of patients with asthma: a cross-sectional study
Kim Watkins, Aline Bourdin, Michelle Trevenen, Kevin Murray, Peter A Kendall, Carl R Schneider & Rhonda Clifford
npj Primary Care Respiratory Medicine 26,
Article number: 16082 (2016) doi: 10.1038/npjpcrm.2016.82

People with asthma who use community pharmacies generally have a poor understanding of how well they are controlling their respiratory problem. Kim Watkins from the University of Western Australia and colleagues surveyed 248 asthma patients recruited from community pharmacies around Perth, Australia, about their disease management practices and awareness. The researchers found a discordance between patient perceptions and actual asthma control: almost half of the study participants had poorly controlled asthma, yet 71% thought they had their disease under control. Only 16% of respondents were following a written asthma action plan, something that has been recommended in Australia for more than 20 years. The authors conclude that community pharmacists provide a unique opportunity to help improve asthma control in those patients who are unlikely to proactively seek support and guidance from clinicians who specialise in asthma management.

Identifying possible asthma-COPD overlap syndrome in patients with a new diagnosis of COPD in primary care
Camilla Boslev Baarnes, Peter Kjeldgaard, Mia Nielsen, Marc Miravitlles & Charlotte Suppli Ulrik
npj Primary Care Respiratory Medicine 27,
Article number: 16084 (2017) doi: 10.1038/npjpcrm.2016.84

A significant proportion of patients newly diagnosed with COPD probably have an asthma component to their condition. Charlotte Ulrik and co-workers at Hvidovre Hospital and the University of Copenhagen, Denmark, together with scientists in Spain, conducted a study of 3,875 patients with at least one respiratory symptom, tobacco exposure and

no previous diagnosis of COPD. Their aim was to characterise asthma-COPD overlap syndrome (ACOS), a recently identified condition that can lead to poor disease outcomes, and develop a definitive algorithm for GPs to use to diagnose ACOS. The team found that 700 of the cohort had COPD, 5.6–27.2% of whom also had ACOS depending on the diagnosis criteria used. Two factors – wheezing and positive bronchodilator reversibility (lung function improvement following asthma inhaler treatment) – seemed most important in ACOS diagnosis.

National guidelines for smoking cessation in primary care: a literature review and evidence analysis
Marjolein Verbiest, Evelyn Brakema, Rianne van der Kleij, Kate Sheals, Georgia Allistone, Siân Williams, Andy McEwen & Niels Chavannes
npj Primary Care Respiratory Medicine 27,
Article number: 2 (2017) doi: 10.1038/s41533-016-0004-8

An international team call for a universal guideline for primary care practitioners who help patients to stop smoking. Although many nations have such guidelines, no studies have examined whether these guidelines are consistent with the current evidence. Marjolein Verbiest at the National Institute for Health Innovation, The University of Auckland, New Zealand, and co-workers of the International Primary Care Respiratory Group and the National Centre for Smoking Cessation and Training reviewed, evaluated and compared 26 national guidelines. Almost all guidelines place importance on identifying smokers, advising them to quit and providing behavioural and medication-based support. However, there were discrepancies in the support offered, which could be due to different interpretations of evidence, costs of medication and cultural differences. The authors offer a checklist for primary care that can inform future universal guidelines suitable for primary care.

Development and validation of the Salzburg COPD-Screening Questionnaire (SCSQ): a questionnaire development and validation study
Gertraud Weiss, Ina Steinacher, Bernd Lamprecht, Bernhard Kaiser, Romana Mikes, Lea Sator, Sylvia Hartl, Helga Wagner & M. Studnicka
npj Primary Care Respiratory Medicine 27,
Article number: 4 (2017) doi: 10.1038/s41533-016-0005-7

Scientists in Austria have developed a brief, simple questionnaire to identify patients likely to have early-stage chronic lung disease. COPD is notoriously difficult to diagnose, and the condition often causes irreversible lung damage before it is identified. Finding a simple, cost-effective method of pre-screening patients with suspected early-stage COPD could potentially improve treatment responses and limit the burden of extensive lung function ('spirometry') tests on health services. Gertraud Weiss at Paracelsus Medical University, Austria, and co-workers have developed and validated an easy-to-use, self-administered questionnaire that could prove effective for pre-screening patients. The team trialled the 5-point Salzburg COPD-screening questionnaire on 1,258 patients. Patients scoring 2 points or above on the questionnaire underwent spirometry tests. The questionnaire seems to provide a sensitive and cost-effective way of pre-selecting patients for spirometry referral.

Effect of tiotropium and olodaterol on symptoms and patient-reported outcomes in patients with COPD: results from four randomised, double-blind studies
Gary T Ferguson, Jill Karpel, Nathan Bennett, Emmanuelle Clerisme-Beaty, Lars Grönke, Florian Voß & Roland Buhl
npj Primary Care Respiratory Medicine 27,
Article number: 7 (2017) doi: 10.1038/s41533-016-0002-x

Results from four in-depth studies show that a combined inhaler is very effective for treatment of moderate to severe chronic lung disease. Alleviating the symptoms of COPD, particularly sleep disturbance, is crucial to enhancing patients' quality of life. Gary Ferguson at the Pulmonary Research Institute of Southeast Michigan, together with other scientists across the USA and Germany, analysed data from four large-scale studies to evaluate the efficacy of STIOLTO Respimat, a combination of two bronchodilators (tiotropium and olodaterol) which tackle airway obstruction and breathlessness, improving long-term lung function. They found that the new drug combination triggered significant improvements in patients' quality of life and levels of breathlessness. Use of night-time rescue medication in patients on STIOLTO Respimat was considerably reduced. A greater number of patients responded positively to the combined inhaler than to monotherapy.

Differences in place of death between lung cancer and COPD patients: a 14-country study using death certificate data
Joachim Cohen, Kim Beernaert, Lieve Van den Block, Lucas Morin, Katherine Hunt, Guido Miccinesi, Marylou Cardenas-Turanzas, Bregje Onwuteaka-Philipsen, Rod MacLeod, Miguel Ruiz-Ramos, Donna M Wilson, Martin Loucka, Agnes Csikos, Yong-Joo Rhee, Joan Teno, Winne Ko, Luc Deliens & Dirk Houttekier
npj Primary Care Respiratory Medicine 27,
Article number: 14 (2017) doi: 10.1038/s41533-017-0017-y

Structured palliative care similar to that offered to cancer sufferers should be in place for patients with chronic lung disease. Joachim Cohen at Vrije University in Brussels and co-workers examined international death certificate data collected from 14 countries to determine place of death for patients with lung cancer and COPD. While patients with COPD suffer similar symptoms to lung cancer in their final days, few COPD patients receive palliative care or achieve the common wish of dying at home. This may be partly due to the inherent unpredictability of final-stage COPD compared with lung cancer. Cohen's team found that, with the exception of Italy, Spain and Mexico, patients with COPD were significantly more likely to die in hospital than at home. They highlight the need for improved COPD palliative care provision.

Best of the rest

These reviews were prepared by Dr Basil Penney and published by Doctors.net.uk Journal Watch. They have been selected and edited for inclusion into *Primary Care Respiratory Update* by editor Dr Iain Small.

The Doctors.net.uk Journal Watch service covers other specialities as well as respiratory medicine. Doctors.net.uk is the largest network of GMC-registered doctors in the UK. To find out more about membership visit http://www.doctors.net.uk

Abbreviations used in these reviews are:

Diseases/disorders

AECOPD	Acute exacerbation of chronic obstructive pulmonary disease
CHD	Coronary heart disease
COPD	Chronic obstructive pulmonary disease
CV	Cardiovascular
ILD	Interstitial lung disease
IPF	Idiopathic pulmonary fibrosis
PTSD	Post-traumatic stress disorder

Measures and investigations

BMI	Body mass index
BDR	Bronchodilator response
CO2	Carbon dioxide
CXR	Chest X-ray
FEV1	Forced expiratory volume in 1 second
FVC	Forced vital capacity
mmHg	Millimetres of mercury
MMRC	Modified Medical Research Council Dyspnoea Scale
pCO2	Partial pressure of carbon dioxide
QoL	Quality of life
SaO2	Oxygen saturation in arterial blood
SpO2	Peripheral capillary oxygen saturation

Organisations

GOLD	Global Initiative for Chronic Obstructive Lung Disease
GINA	Global Initiative for Asthma

Respiratory treatments

ICS	Inhaled corticosteroids
LABA	Long-acting beta-agonist
LAMA	Long-acting muscarinic agent
SABA	Short-acting beta-agonist

Statistical terms

n	Number(s)
HR	Hazard ratio
RCT	Randomised controlled trial
RR	Relative risk
SD	Standard deviation
95% CI	95% Confidence interval

**** EDITOR'S CHOICE ****

Reevaluation of Diagnosis in Adults with Physician-Diagnosed Asthma
Shawn D Aaron, Katherine L Vandemheen, J Mark FitzGerald, *et al*.
JAMA 2017;317(3):269–79. doi: 10.1001/jama.2016.19627

Diagnosis of asthma in the community can be difficult. Various phenotypes have different triggers and clinical presentations. Furthermore, asthma can be episodic or can follow a relapsing and remitting course, which further complicates attempts to arrive at a diagnosis. Studies suggest fewer than half of patients receive spirometry testing to confirm variable expiratory airflow limitation prior to diagnosis. Furthermore, the expected rate of spontaneous remission of adult asthma, allowing for complete cessation of asthma therapy, is unknown.

This prospective, multicentre cohort study from Canada aimed to determine whether asthma could be ruled out in newly diagnosed adults and whether they could be safely weaned off asthma medications. Participants had physician-diagnosed asthma established within the past 5 years. Patients were excluded if they were using long-term oral steroids, were pregnant, breastfeeding or unable to perform diagnostic tests or had a smoking history >10 pack-years. All participants (n=613) were assessed with peak flow and symptom monitoring, spirometry and serial bronchial challenge tests, and those on daily medication had it gradually tapered off. Participants in whom asthma was ruled out were followed up over 1 year.

Asthma was ruled out in 203 (33%) of 613 study participants. 12 participants had cardiorespiratory conditions previously misdiagnosed as asthma. 181 participants continued to exhibit no evidence of asthma after 12 months. This group was less likely to have undergone testing for airflow limitation in the community at the time of initial diagnosis.

Among some adult patients with physician-diagnosed asthma, reassessing that diagnosis may be warranted.

**** EDITOR'S CHOICE ****

Airway inflammation in COPD after long-term withdrawal of inhaled corticosteroids

Lisette I Z Kunz, Nick H T ten Hacken, Thérèse S Lapperre, Wim Timens, Huib A M Kerstjens, Annemarie van Schadewijk, Judith M Vonk, Jacob K Sont, Jiska B Snoeck-Stroband, Dirkje S Postma, Peter J Sterk, Pieter S Hiemstra

Eur Respir J 2017;49:1600839 doi: 10.1183/13993003.00839-2016

COPD is characterised by chronic inflammation in the airways and as the disease progresses to more severe airflow limitation, airway inflammation increases over time. Except for smoking cessation, there is currently no therapy that halts the inflammatory process in the airways. Treatment with inhaled corticosteroids (ICS) is recommended for patients with severe and very severe COPD in cases of frequent exacerbations. Discontinuation of ICS may increase the number of exacerbations and accelerate lung function decline in patients with COPD. However, little is known about the effect of ICS discontinuation on airway inflammation.

Kunz *et al* report an observational 5-year follow-up to the GLUCOLD study from the Netherlands. The primary outcome was the effect of ICS withdrawal on inflammatory cell counts in bronchial biopsies.

Counts of several inflammatory cell types in bronchial biopsies and sputum significantly increased during a 5-year follow-up in patients with moderate-severe COPD who did not use or only intermittently used ICS after previous randomisation to 30-month ICS treatment. In addition, they found a significant association between the accelerated rate of lung function decline and the increase in sputum macrophages and a similar trend with bronchial neutrophils.

These results suggest that airway inflammation is suppressed during active treatment with ICS and might relapse after discontinuation of long-term ICS treatment.

Bronchiectasis and the risk of cardiovascular disease: a population-based study

Vidya Navaratnam, Elizabeth R C Millett, John R Hurst, Sara L Thomas, Liam Smeeth, Richard B Hubbard, Jeremy Brown, Jennifer K Quint

Thorax 2017;72:161–6
doi: 10.1136/thoraxjnl-2015-208188

Some studies have suggested a high prevalence of cardiovascular disease in people with bronchiectasis and, more recently, a case-control study demonstrated that people with bronchiectasis had increased arterial stiffness compared with matched controls. This cross-sectional study used primary care electronic records from the Clinical Practice Research Datalink to quantify the burden of cardiovascular comorbidities among people with bronchiectasis and to determine if individuals with bronchiectasis are at higher risk of first time cardiovascular events compared with those without bronchiectasis.

A total of 10,942 people (0.3%) from the database had a record of bronchiectasis prior to the index date; the majority were female (60.4%) and the median age at diagnosis was 56.5 years. The prevalence of risk factors for CHD or stroke was higher in people with bronchiectasis. Pre-existing diagnoses of CHD (OR 1.33, 95% CI 1.25 to 1.41) and stroke (OR 1.92, 95% CI 1.85 to 2.01) were higher in people with bronchiectasis compared with those without bronchiectasis after adjusting for age, sex, smoking and risk factors for cardiovascular disease. The rate of first CHD and stroke were also higher in people with bronchiectasis.

These findings suggest that, if a cohort of 100 people with bronchiectasis were followed up for 5 years, they would have three CHD events and five strokes whereas 100 people without bronchiectasis would have one CHD event and one stroke.

An increased awareness of these cardiovascular comorbidities in this population is needed to provide a more integrated approach to the care of these patients. As with many such studies, this work demonstrates association, but not necessarily causation.

Different dyspnoea perception in COPD patients with frequent and infrequent exacerbations

Giulia Scioscia, Isabel Blanco, Ebymar Arismendi, Felip Burgos, Concepción Gistau, Maria Pia Foschino Barbaro, Bartolome Celli, Denis E O'Donnell, Alvar Agustí

Thorax 2017;72:117–21
doi: 10.1136/thoraxjnl-2016-208332

While some patients with COPD have frequent exacerbations (FE), others suffer them infrequently (IE). Given that the diagnosis of AECOPD currently relies almost entirely on the patient's perception of an acute increase of symptoms (mostly breathlessness), could over-perception of dyspnoea be associated with frequent exacerbators whereas poor perception may be related to infrequent exacerbators?

This observational cross-sectional study compared the perception of dyspnoea during CO2 rebreathing in COPD patients with frequent (≥2 exacerbations or 1 hospitalisation in the previous year) and infrequent (≤1 exacerbation in the previous year) exacerbations. AECOPD was defined by the need for treatment with antibiotics and/or steroids or admission to hospital.

34 COPD patients (14 frequent and 20 infrequent exacerbators) who had been clinically stable during 3 months and 10 age-matched healthy controls with normal spirometry were compared for perception of dyspnea (Borg scale), mouth occlusion pressure 0.1 s after the onset of inspiration and ventilatory response to hypercapnia. Dyspnoea perception during CO2 rebreathing was different in COPD patients with frequent exacerbations (enhanced) compared to those with infrequent exacerbations (blunted).

While this was a small study, these differences may contribute to the differential rate of reported exacerbations in frequent and infrequent exacerbators.

Effect of statins on disease-related outcomes in patients with idiopathic pulmonary fibrosis

Thorax

Michael Kreuter, Francesco Bonella, Toby M Maher, Ulrich Costabel, Paolo Spagnolo, Derek Weycker, Klaus-Uwe Kirchgaessler, Martin Kolb
Thorax 2017;72:148–53
doi: 10.1136/thoraxjnl-2016-208819

Statins have been shown to attenuate the decline in pulmonary function associated with normal ageing, with the magnitude of the protective effect apparently modified by smoking status. While the effect of statins on disease-related outcomes in patients with COPD has been investigated, the relationship between statins and the development of ILD is controversial.

Kreuter *et al* carried out a post hoc analysis of data from the placebo arms of three phase III randomised, controlled, double-blind clinical trials of pirfenidone in IPF to study the effect of statins on mortality and other clinically relevant disease-related outcomes in a well-defined population of patients with IPF (n=624). Outcomes assessed during the 1-year follow-up included disease progression, mortality, hospitalisation and composite outcomes of death or ≥10% absolute decline in FVC and death or ≥50 m decline in 6-minute walk distance (6MWD).

276 (44.2%) were receiving statin therapy at baseline. Statin users were older than non-users and a greater proportion of statin users were male, had a significantly higher prevalence of CV disease and CV risk factors at baseline. In multivariate analyses adjusting for differences in baseline characteristics, statin users had lower risks of death or 6MWD decline, all-cause hospitalisation, respiratory-related hospitalisation and IPF-related mortality versus non-users.

The results provide support for the hypothesis that statins may be beneficial in patients with IPF. Future studies should include prospective analyses of statin use in IPF (if possible matching for age and established rate of lung function decline) and their potential use in combination with antifibrotic therapies.

A randomised controlled trial of tiotropium in adolescents with severe symptomatic asthma

EUROPEAN RESPIRATORY *journal*

Eckard Hamelmann, Jonathan A Bernstein, Mark Vandewalker, Petra Moroni-Zentgraf, Daniela Verri, Anna Unseld, Michael Engel, Attilio L Boner
Eur Respir J 2017;49:1601100
doi: 10.1183/13993003.01100-2016

Tiotropium is efficacious and well tolerated as add-on therapy to at least ICS maintenance therapy in adults with symptomatic asthma. Phase II and III studies of tiotropium Respimat as add-on to medium dose ICS in adolescents with moderate symptomatic asthma improves lung function and asthma control, with safety and tolerability comparable with those of placebo.

This 12-week phase III randomised, double-blind, placebo-controlled, parallel-group trial investigated the efficacy and safety of once-daily tiotropium Respimat 5 µg and 2.5 µg as add-on to ICS plus one or more controller therapies over 12 weeks in adolescents (n=392) aged 12–17 years with severe symptomatic asthma. The primary and key secondary end-points were change from baseline (response) in FEV_1 within 3 hours post-dosing (FEV_1 (0–3h)) and trough FEV_1, respectively, after 12 weeks of treatment. Patients were randomised in a 1:1:1 ratio to receive tiotropium 5 µg (two puffs of 2.5 µg) or 2.5 µg (two puffs of 1.25 µg) or placebo (two puffs), each delivered via the Respimat Soft Mist inhaler as add-on to pre-enrolment background therapy with ICS plus one or more controller therapies.

Tiotropium Respimat add-on to ICS plus one or more controller therapies in adolescents with severe symptomatic asthma was well tolerated. The primary end-point of efficacy was not met, although positive trends for improvements in lung function and asthma control were observed.

The place for tiotropium in the paediatric management pathway remains unclear.

Comprehensive care programme for patients with chronic obstructive pulmonary disease: a randomised controlled trial

Thorax

Fanny WS Ko, NK Cheung, Timothy H Rainer, Christopher Lum, Ivor Wong, David S C Hui
Thorax 2017;72:122–8
doi: 10.1136/thoraxjnl-2016-208396

The cost of hospital admissions is the largest expenditure on patients with COPD. A recent meta-analysis has suggested that integrated disease-management programmes improved disease-specific QOL and exercise capacity, in addition to reducing hospital admissions and hospital days per person. This randomised controlled trial from Hong Kong assessed whether a comprehensive care programme would decrease hospital readmissions and length of hospital stay (LOS) for patients with COPD.

Patients who had been admitted with AECOPD were randomised to either an intervention group (n=90) or usual care (n=90). The intervention group received a care plan which included education from a respiratory nurse, physiotherapist support for pulmonary rehabilitation, 3-monthly telephone calls by a respiratory nurse over 1 year and follow-up at a respiratory clinic with a respiratory specialist once every 3 months for 1 year. The usual care group was managed according to standard practice.

The mean age was 75 years and the majority were men with mean FEV_1 45.4±16.6% predicted. Patients were excluded if they had other pulmonary co-morbidities or heart failure. At 12 months the adjusted relative risk of readmission was 0.668 (95% CI 0.449 to 0.995, p=0.047) for the intervention group compared with the usual group. The intervention group had a shorter LOS, greater improvement in mMRC and QOL compared with usual care.

The highly selective nature of the participant characteristics and the frequency of specialist review limits its applicability to other care models. Further studies are needed to test which component(s) would contribute more to the desired outcomes and to assess the cost effectiveness of such programmes for patients with COPD.

Obesity is associated with increased morbidity in moderate to severe COPD

CHEST

Allison A Lambert, Nirupama Putcha, M Bradley Drummond, Aladin M Boriek, Nicola A Hanania, Victor Kim, Gregory L Kinney
Chest 2017;151:68–77
doi: 10.1016/j.chest.2016.08.1432

Much attention has been given to the association between COPD and

low BMI, with studies suggesting a U-shaped relationship between weight and general health outcomes in individuals with COPD. While obesity may be linked to adverse health consequences in patients with COPD, these consequences are not well delineated.

Lambert *et al* examined a cohort of 3,753 participants with stage 2–4 GOLD-defined COPD from the multicentre Genetic Epidemiology of COPD (COPDGene) study to determine the impact of obesity on COPD morbidity. Participants with a low BMI (BMI <18.5 kg/m^2; n =122) who may represent a unique phenotype were compared with normal or overweight individuals. Logistic and linear regression analyses were used to determine the association between COPD outcomes and obesity class, adjusting for relevant confounders.

35% of participants were obese, with 21% class I (BMI range 30–34.9 kg/m^2), 9% class II (BMI range 35–39.9 kg/m^2) and 5% class III (BMI ≥40 kg/m^2). Increasing obesity class was associated with increased comorbidity ($p<0.001$), reduced QOL, impaired functional status and increased risk for severe AECOPD. Importantly, even class I obesity adversely impacted COPD outcomes, with increasing severity of obesity associated with greater magnitude of deficits in a dose-dependent fashion.

Obesity in patients with COPD may contribute to a worse COPD-related course.

Should recommendations about starting inhaled corticosteroid treatment for mild asthma be based on symptom frequency: a post-hoc efficacy analysis of the START study

THE LANCET

Helen K Reddel, William W Busse, Søren Pedersen, Wan C Tan, Yu-Zhi Chen, Carin Jorup, Dan Lythgoe, Paul M O'Byrne
Lancet 2017;389:157–66
doi: 10.1016/S0140-6736(16)31399-X

ICS treatment leads to improvement in the two key domains of asthma control – namely, improved symptom control and reduced risk of adverse asthma outcomes. Asthma guidelines suggest that those with intermittent asthma (generally identified by symptom frequency of 2 days or fewer per week) have treatment with only as needed SABA, with regular maintenance ICS treatment reserved for patients with more frequent symptoms. However, no evidence supports this symptom-based cut-off for initiation of ICS nor the long-term safety of treating asthma with SABA alone. Reddel et al conducted a post-hoc analysis of the START study to assess the validity of the symptom-based cut-off for starting ICS.

Patients (aged 4–66 years) with mild asthma diagnosed within the previous 2 years and no previous regular corticosteroids were randomised to receive once daily inhaled budesonide 400 µg (those aged <11 years 200 µg) (n=3,577) or placebo (n=3,561). Participants were clustered by baseline asthma symptom frequency (0–1 symptom days per week, >1 to ≤2 symptom days per week and >2 symptom days per week).

Use of ICS increased time to first severe asthma-related events (emergency visits, hospital admission, or death), halved the risk of severe exacerbations, reduced lung function decline and improved asthma symptoms compared with placebo, irrespective of baseline symptom frequency. The findings challenge long-standing assumptions about the risks of mild asthma and suggest that decisions about ICS treatment in such patients should be made on the basis of population risk reduction rather than on symptom frequency.

A systematic review of the effectiveness of discharge care bundles for patients with COPD

Thorax

M B Ospina, K Mrklas, L Deucher, B H Rowe, R Leigh, M Bhutani, M K Stickland
Thorax 2017;72:31–9
doi: 10.1136/thoraxjnl-2016-208820

Optimising care during and after an exacerbation of COPD (AECOPD) is important to reduce the risk of relapse and readmission. Gaps in the transition from acute to community care have been identified including lack of access to timely follow-up and disease management programmes, failure to ensure optimal vaccinations, inappropriate medication prescriptions and failure to address smoking cessation or refer to pulmonary rehabilitation. There is evidence that care bundles for admission and in-hospital management of an AECOPD have a positive impact on mortality, hospital readmissions and length of stay.

Ospina *et al*'s systematic review describes the varied interventions used in bundles studied and their impact on hospital re-admissions and emergency department returns as well as patient-oriented outcomes. The review included 14 studies (5 clinical trials, 7 uncontrolled trials and 2 interrupted time series). There were important variations in the number and types of interventions incorporated in discharge care bundles across the studies. Discharge care bundles included between 2 and 12 individual interventions, and there were 26 distinct elements listed across all bundles. Of the five clinical trials, four had moderate risk of bias and one had a high risk of bias.

COPD discharge bundles reduced hospital readmissions (pooled risk ratio (RR) 0.80; 95% CI 0.65 to 0.99). There was insufficient evidence that care bundles influence long-term mortality or quality of life.

Further studies are required to enhance the accuracy of estimates of effectiveness of discharge care bundles in patients with AECOPD and to identify the most effective individual components.

Home-based rehabilitation for COPD using minimal resources: a randomised, controlled equivalence trial

Thorax

Anne E Holland, Ajay Mahal, Catherine J Hill, Annemarie L Lee, Angela T Burge, Narelle S Cox, Rosemary Moore, Caroline Nicolson, Paul O'Halloran, Aroub Lahham, Rebecca Gillies, Christine F McDonald
Thorax 2017;72:57–65
doi: 10.1136/thoraxjnl-2016-208514

Despite the compelling evidence for its benefits, pulmonary rehabilitation is delivered to fewer than 10% of people with COPD who would benefit. 50% of those who are referred to pulmonary rehabilitation will never attend and, of those who present at least once, up to a third will not complete the programme. Home-based pulmonary rehabilitation is an alternative model that could improve uptake and access. Initial reports suggest that home-based pulmonary rehabilitation is safe and may improve clinical outcomes.

This randomised controlled equivalence trial assessed whether 8 weeks home-based pulmonary rehabilitation (n=80), delivered using minimal resources, had equivalent outcomes to centre-based pulmonary rehabilitation (n=86). Assessments were blinded to group allocation. The home-based model included one home visit and seven once-weekly telephone calls from a physiotherapist. The primary outcome was change in 6 min walk distance (6MWD).

This home-based pulmonary rehabilitation model, using minimal resources and little direct supervision, resulted in short-term improvements in 6MWD and HRQoL that were equal to or greater than those seen in a centre-based programme. Equivalent QoL outcomes were observed at 12 months following programme completion, although it was not possible to exclude inferiority for 6MWD at this time point. Gains in both groups were poorly maintained at 12 months.

Home-based pulmonary rehabilitation could be considered for people with COPD who cannot access centre-based pulmonary rehabilitation.

Post-traumatic stress disorder, bronchodilator response, and incident asthma in World Trade Center rescue and recovery workers

Rafael E de la Hoz, Yunho Jeon, Gregory E Miller, Juan P Wisnivesky, Juan C Celedón

Am J Respir Crit Care Med 2016;194:1383–91

doi: 10.1164/rccm.201605-1067OC

A few cross-sectional studies have shown that exposure to traumatic events or PTSD is associated with asthma symptoms or self-reported asthma. BDR to short-acting inhaled beta-agonists is widely used to support a diagnosis of asthma in adults. Whether PTSD is associated with BDR or new-onset (incident) asthma is unknown.

de la Hoz *et al* used data from a high-risk cohort of 11,481 World Trade Center workers in New York, including 6,133 never smokers without a previous diagnosis of asthma to determine the relationship between probable PTSD and both BDR and incident asthma. All subjects underwent a baseline screening evaluation, which included respiratory symptoms, occupational exposures, self-reported physicians' diagnoses, the PTSD Checklist and spirometry.

Subsequent ('monitoring') health surveillance visits, including a similar evaluation, were scheduled at 12- to 18-month intervals. Probable PTSD was defined as a score of ≥44 points in the PTSD Checklist questionnaire, and BDR was defined as both a change ≥12% and an increment of ≥200 mL in FEV_1 after bronchodilator administration. 3,757 (61.3%) never smokers without asthma completed a follow-up visit several years later (mean 4.95 years).

Among all study participants, probable PTSD was significantly associated with 1.44 times increased odds of having BDR. After adjustment for age, sex and other covariates, probable PTSD in never smokers without asthma remained significantly associated with 2.41 times increased odds of incident asthma.

This finding strongly supports a link between stress-related disorders such as PTSD and the development of asthma.

SECOND OPINION

Your respiratory questions answered...

Question: I am a GP who sees a lot of respiratory patients and have recently had patients coming to see me to say that the inhaler they have been dispensed is not the same as the one they have had previously – in some cases for many years. What can I do to ensure that patients get the inhaler that they are familiar with?

Answer: Unfortunately, as generic medications hit the market, there are increasing financial pressures to switch to these regardless of the fact that the actual inhaler device may be totally different. This can confuse patients and lead to loss of disease control. We know that NICE recommends patients are given specific training and assessment in inhaler technique before starting on any new treatment or device to make sure they can use it. If they can't, it is no cost saving.

The easiest and safest way to ensure your patients receives the exact treatment you intended is to prescribe the inhaler using its branded name; this can usually be set in your computer system as your preferred default.

The UK Inhaler Group have recently published the Inhaler Standards and Competency Document intended to be used as a framework to set, assess and support the standards of those initiating inhaler therapies and checking inhaler techniques to work with patients to optimise their technique and maximise the benefit of their medication.

http://www.respiratoryfutures.org.uk/media/69775/ukig-inhaler-standards-january-2017.pdf
https://www.nice.org.uk/guidance/qs10/chapter/quality-statement-2-inhaler-technique
https://www.nice.org.uk/guidance/qs25/chapter/quality-statement-4-inhaler-technique

Have you got a question for Second Opinion?
If you have a question for Second Opinion please submit your question to info@pcrs-uk.org quoting "Second Opinion" in the subject line

PCRS-UK News Round-Up

EXECUTIVE NEWCOMER BRINGS OPPORTUNITY FOR CLOSER INTEGRATION BETWEEN PRIMARY AND SECONDARY CARE

An integrated respiratory physician has been elected for the first time to the PCRS-UK Executive, creating an opportunity for the Society to focus on closer integration between primary and secondary care.

Dr Vince Mak, Consultant Physician in Respiratory Integrated Care, Imperial College Healthcare and Central London Community Healthcare Trusts, has had a long standing interest in providing care for respiratory illness in the community rather than in the hospital as a means of improving patient outcomes.

He says: "I am grateful for this opportunity to help bring secondary and integrated care specialists to work more closely with our primary care colleagues. This is something that I am very passionate about as I think that it is important to integrate care as the future of long-term condition care."

Vikki Knowles, Respiratory Nurse Consultant and PCRS-UK Regional Lead for South East England and Dr Katherine Hickman, Leeds GP and PCRS-UK Regional Lead for Yorkshire and Humber have both been re-elected.

Vikki says: "I have gained so much from being part of this group. I have held various respiratory nursing posts over the past two years, moving from secondary care to community services and finally into commissioning. I have been able to share this experience with the PCRS-UK Executive and being a member of the committee has enabled me to develop my skills within each new role. The support of my colleagues has enhanced my knowledge and ability to work with each new challenge I have taken on."

Dr Hickman says: "It is a privilege for me to be elected to serve a further term on the PCRS-UK Executive. Being a link between the various other committees I sit on and sitting on the Executive has been invaluable and given me a true feel of how the organisation works. PCRS-UK has undergone some dramatic changes over the last three years including the partnership with Nature, launching the Primary Care Respiratory Academy and a new website, to name but a few, and it has been an honour to be part of this transformation. I look forward to being part of PCRS-UK's future for many years to come."

A NEW FOCUS FOR *NPJ PRIMARY CARE RESPIRATORY MEDICINE*

npj | Primary Care Respiratory Medicine

A new Deputy Editor, Professor Kamran Siddiqi, has been appointed to the *npj Primary Care Respiratory Medicine* editorial board to help extend the scope of the journal to publishing on tobacco control, implementation science and global health in addition to publishing more on clinical respiratory medicine.

The new position has been created following the retirement of the journal's joint Editor-in-Chief, Dr Paul Stephenson, a GP and Honorary Clinical Research Fellow, Allergy and Respiratory Research Group, Centre for Population Health Sciences at The University of Edinburgh.

The journal, formerly the *Primary Care Respiratory Journal,* has gone from strength to strength since it was relaunched as *npj Primary Care Respiratory Medicine* in May 2014 in partnership with Springer Nature. A Nature Research journal, it is now part of the Nature Partner Journals series of titles.

It has published over 190 articles since it was relaunched and currently has a worldwide readership spanning 187 countries. Over 1,550 people have subscribed to the journal's article e-alert list and there have been over 1,450 mentions of journal articles across social media in 2016.

The new editorial structure will mean the journal will now have an Editor-in-Chief, Deputy Editor, Statistical Editor and a smaller group of Assistant Editors with expertise in various sub-specialities. "Having a smaller, more tightly knit structure will enable us to improve the quality and speed of decision making," says Editor-in-Chief Professor Aziz Sheikh.

The core ethos of the publication will remain the same, to be a multidisciplinary journal dedicated to publishing high-quality research in all areas of the primary care management of respiratory and respiratory-related allergic diseases.

However, the new editorial focus and a relaunched website is intended to give the journal a greatly increased reach through the Nature Research networks and help it to increase its social media footprint.

Aziz says the journal is a great place to publish: "We pride ourselves on providing first-rate peer review and working with authors to improve the quality of the material we publish. We are also committed to widespread dissemination of papers so authors can be confident that their work will have an impact."

He says they will also be working to attract a younger cohort of researchers: "We are committed to attracting brilliant new minds to the fields of primary care respiratory research as this is crucial to ensuring the further development of this still nascent field and, importantly, improving outcomes for patients leaving with these all so common disorders. Those with ideas for potential submissions should feel free to approach the editorial team and/or submit a pre-submission enquiry outlining their plans."

Find Out More

- *npj Primary Care Respiratory Medicine* is online-only and open access; all journal articles are freely available to read online. Visit the journal website to explore all

Dr Paul Stephenson

Paul worked with Aziz and the team at Springer Nature to relaunch the journal as *npj Primary Care Respiratory Medicine* and played a key role in communicating why this change was important and ensuring that the journal continued to develop during a time of change.

He oversaw the journal's inclusion within PubMed and ISI, acted as mentor to new editors and played a key role in conducting quality control checks, in particular in relation to copy editing.

Aziz says Paul served as a champion for the journal acting as the 'face' of the journal in the community, worked hard to proactively engage with the scientific community and was an important link between the journal and PCRS-UK. "Paul has been the backbone and soul of the journal for the last two decades, serving most recently in the roles of Deputy Editor and then joint Editor-in-Chief. His contribution to establishing *npj Primary Care Respiratory Medicine* as the flagship journal it now is, is immense and has been appreciated by colleagues across the world of primary care respiratory research. Paul's input will be sorely missed."

content and to sign up to receive free article e-alerts to receive a monthly summary of content straight to your inbox: http://www.nature.com/npjpcrm/

- You can also read *npj Primary Care Respiratory Medicine* article summaries in each issue of *Primary Care Respiratory Update*: https://pcrs-uk.org/pcru
- These three editorials explain the benefits of the new partnership with the Nature Publishing Group here: http://www.nature.com/articles/pcrj201113; http://www.nature.com/articles/pcrj201422; http://www.nature.com/articles/npjpcrm201531

Professor Kamran Siddiqi

Kamran Siddiqi is a clinical academic with a background in chest medicine, public health and epidemiology. He works at the University of York as a professor in global public health and holds an honorary consultant post in public health medicine at Public Health England. He also chairs the tobacco control section at the International Union Against TB and Lung Diseases.

Previously, Kamran has worked as a consultant in chest medicine, education advisor to the National Institute of Health and Care Excellence (NICE) and medical officer at the World Health Organisation. He has served on several national funding boards and NICE guideline development committees. Kamran has published extensively on TB diagnosis, tobacco control and smoking cessation.

Why did you apply for the post of Deputy Editor in Chief?
"Primary care plays a pivotal role in preventing, diagnosing and managing patients with respiratory diseases. In order to perform this role competently, primary care practitioners need high-quality evidence. I was looking to work for a journal that makes such evidence accessible to those who work in primary care."

What do you like about the journal?
"*npj Primary Care Respiratory Medicine* is unique in the sense that it answers questions relevant to most primary care practitioners dealing with patients with respiratory diseases."

Why is the journal a great place to publish?
"*npj Primary Care Respiratory Medicine* is open access, part of a renowned and high-quality publishing family, and is the first choice journal for primary care practitioners looking for the best evidence in respiratory medicine."

What do you hope to achieve in your new post?
"I would like to help the journal to become a global leader in debating on lung health issues while retaining its original role of helping primary care practitioners in making the best decisions for their patients."

Delivering Excellence Locally

Featuring initiatives led by PCRS-UK members around the UK, supported by PCRS-UK programmes and tools

An affordable solution for meeting the standards of the new National Register for quality assured spirometry


Francesca Robinson talks to PCRS-UK Executive member **Vikki Knowles** about a pragmatic solution she has devised for training her colleagues to the required standards of the new National Register of certified spirometry professionals and operators

A Respiratory Nurse Consultant, Vikki was Clinical Lead for West Surrey's community multidisciplinary respiratory care teams but is currently seconded to Guildford and Waverley Clinical Commissioning Group (CCG). She is a member of the Respiratory Expert Advisory Group (REAG) of the Kent, Surrey and Sussex Academic Health Science Network (AHSN) and a trainer for Education for Health.

The new competency assessment framework which describes the process by which healthcare professionals can become certified and join the new National Register for quality assured spirometry[1] was launched in April and has been welcomed by PCRS-UK.

However, there is a fear that it may be seen as causing difficulties for CCGs and practices in financially challenging times, who may see the cost of training healthcare professionals to the required Association for Respiratory Technology and Physiology (ARTP) standard as unaffordable.

Vikki explains: "We need to be careful that people do not interpret the new scheme as requiring everyone who provides respiratory care in primary care to undergo 'gold standard' training. Locally, there has been concern that practices might not reach the level of competency identified in the new scheme leading to disengagement in the provision of spirometry. This has the potential to prejudice patient care and the practice income. If this was to happen, there is the possibility of a significant increase in referrals, either to another service to perform spirometry or secondary care clinics to diagnose and manage long-term conditions that could otherwise be looked after in primary care."

Vikki has come up with a pragmatic solution to spirometry training for her locality. In her role as a member of KSS AHSN REAG and Respiratory Nurse Lead for Guildford and Waverley CCG, she has been working on the problem for the last three years with Simon Dunn, a GP from Kent, and other respiratory colleagues.

Initially, Vikki identified there was a need to skill up the workforce locally to meet the requirements identified in the new scheme. The workforce consisted of a mixture of practice nurses carrying out spirometry, who had had good training but not necessarily to the ARTP standard, while others had done only a minimal half-day study. Meanwhile, some of the more highly qualified nurses were reaching retirement age, leading to a shortage in the skill set, and many GPs had concerns regarding their spirometry interpretation skills because they had devolved spirometry to their practice nurses. "GPs", she says, "were aware that this was an issue and were asking for this training because they understood the importance of their staff performing spirometry to the correct standard."

The REAG had discussed the need for an affordable training package as a viable, safe and cost effective 'silver standard' alternative. As some funding was arranged, the only cost to practices was for releasing their healthcare professionals for the day.

The package, provided by an affordable private training organisation, which is run by trainers who have achieved ARTP accreditation, comprises a study day with an assessment at the end of the day. The day is split into a practical session in the morning and an interpretation session in the afternoon. Six weeks later candidates are required to submit a portfolio of their work to Vikki for review to ensure the spirometry is being performed to the correct standard and that calibration and cleaning logs have been completed. Additional traces with interpretation are submitted for the candidates responsible for reporting on the spirometry. This ensures that everything is to the standards set by the requirements of the new register.

Because the AHSN is not an educational organisation or aligned with a university, Vikki can only record that she is satisfied that the spirometry they are performing is of a high quality and meets the quality guidance that has been set for Kent, Surrey and Sussex AHSN. Vikki is

hoping that candidates who have attended the training and completed the portfolio to a satisfactory standard can then be accepted on to the register via the Experienced Practitioner Scheme.

As there had been no identifiable funding set aside locally for the training package, a variety of avenues were explored to fund the training which included Health Education England (HEE) funding and industry.

To date, three study days have been run with 20 practice nurses and three GPs from 11 practices attending the full day and three healthcare assistants for a half-day to learn the practical component of doing spirometry. Feedback has been positive with attendees saying they learned a lot. Vikki's eventual aim is to have at least one nurse and one GP from every practice across Guildford and Waverley CCG complete the course. Vikki attends every study day to ensure she is marking the spirometry to the level that it is being taught.

Guildford and Waverley CCG is supportive of Vikki's work and have put forward a business case for a Locally Commissioned Service (LCS) to provide a diagnostic spirometry service from next year which will support the training. This is excellent news for the CCG; however, Vikki says: "The bottom line is that, although the LCS is in the pipeline, it will be reliant on working with our colleagues in HEE and industry to fund the training during this financially challenging time."

"The new register and the requirement for healthcare professionals to be trained to perform high quality spirometry are a good thing and it is important because there are huge implications – if you get spirometry wrong, you get the whole diagnosis wrong, then you're potentially giving patients drugs they don't actually need at vast cost, you're labelling them with a condition they haven't got and you are potentially increasing hospital admission rates because patients aren't being treated correctly."

"In the absence of central government money to support the necessary training and implementation we need to find creative, cost effective ways of doing it locally."

TIPS FOR SETTING UP A TRAINING SCHEME FOR PERFORMING SPIROMETRY:

Look at what your local needs are

- Identify locally committed people who can work wit you because you can't do it on your own
- Nominate a spirometry champion to support practices achieve the training.
- Identify support within your CCG
- Link with existing organisations who provide spirometry training and agree a training package which meets your local needs

Reference

1. Primary Care Commission. Improving the quality of diagnostic spirometry in adults: the National Register of certified professionals and operators. https://www.pcc-cic.org.uk/article/quality-assured-diagnostic-spirometry

The role of the Respiratory Nurse Educator (RNE) in care homes: Respiratory disease management

Sarah Newton, Respiratory Nurse Educator, and **Natalie Shouler**, Service Improvement Manager, Nottingham North and East Clinical Commissioning Group (NNE CCG), report on a recent project to provide respiratory education in care homes

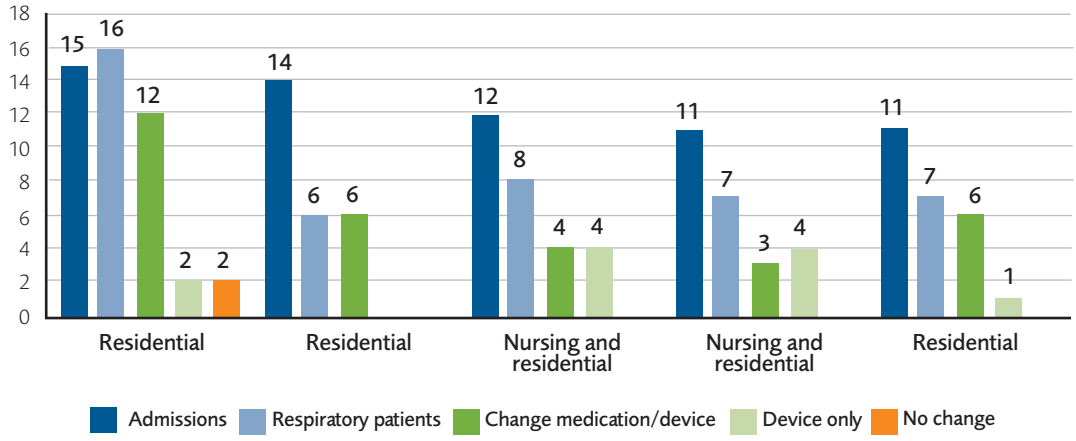
Managing respiratory conditions in care homes is complex. Residents have a combination of complex medical conditions and may take multiple medications, including inhaled medications. Medication errors occur because of failure in prescribing, dispensing, administering or monitoring medication, and inhalers and liquid medications are the most frequently poorly administered medications.[1] It is known that one in 10 care home residents will have been prescribed an inhaler-based medicine for some sort of respiratory disorder.[2] Many residents depend on care home staff for medications, yet studies have shown that 91% of healthcare professionals are unable to demonstrate the seven steps in administering pressurised meter dosed inhalers (pMDIs).[3] This impacts on the wellbeing of residents and the cost-effectiveness of medications.

Studies show inhaler training for healthcare professionals improves prescribing and reduces admissions.[4]

Method

In July 2015, the Respiratory Nurse Educator (RNE) undertook a pilot project in five care homes in the area with the highest number of

Figure 1 Care home respiratory admissions. (n=44)



respiratory hospital admissions (Figure 1). External and in-house training sessions were facilitated and attended by 41 care home staff. The RNE facilitated a ward round to review respiratory patients, recommending changes to devices and/or medication to the home and the residents' registered GP practice, resulting in 42/44 patients (95%) requiring a change. All recommendations were implemented.

The results of the pilot led to a programme of in-house training for staff in all 36 eligible care homes. Training encompassed inhaler techniques using 'incheck' devices and placebo inhalers, alongside medication management for COPD and asthma.

Thirty-five of 36 (97%) care homes participated in the training with 171 attending the training. Attendees gave overwhelmingly positive feedback on the evaluation sheets, including increased knowledge and confidence in both inhaler and condition management.

Ward rounds were provided to all 35 care homes for all residents using inhalers. Residents were reviewed and outcome recommendations communicated to the patient's registered GP and followed up a month later. All recommendations bar one were implemented.

Results

Of the 117 patients reviewed, 104 (89%) required a change to either their inhaler, medication or both.

- 23 (19%) patients only on short-acting beta agonists (SABA) with pMDIs were not using spacers
- 18 (15%) patients on inhaled corticosteroid (ICS) pMDIs were not using spacers
- 26 (17%) patients prescribed a dry powder inhaler (DPI) but no spacer for rescue medication
- 16 (14%) patients prescribed large volume spacers
- 10 (9%) patients no rescue SABA was recorded on Medication Administration Records (MARS) charts.

The review recommended:

- 26/117 (22%) change from (DPI) to pMDI and spacer[5]
- 41/117 (35%) on SABA only and ICS pMDI prescribed aerochamber spacers
- 16 (14%) patients disliking large volume spacers offered small volume spacers
- 10 (9%) SABA pMDI prescribed for those with no rescue medication

All recommendations were implemented bar one (long-acting beta agonists (LABA) recommended, GP prescribed an ICS/LABA). Treatment was also reviewed and adjusted for patients who had poor technique and were unable to use certain inhalers or had complained of side effects.

In total, 75 /117 (64%) aerochambers and 18/117 (15%) aerochambers and masks were prescribed.

Both reviews found similar issues across all categories of homes (Figure 2).

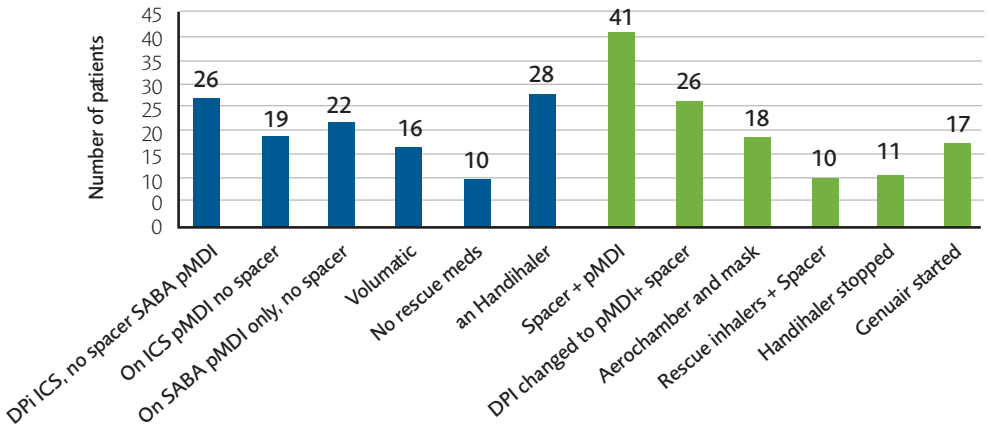
Discussion

Reductions in hospital admission were not observed during the autumn quarter but staff stated:

- improved knowledge basis for inhaler technique and spacers
- improved knowledge in managing respiratory conditions and confidence identifying and acting on poor inhaler technique[6]
- improved quality of life for patients
- increase in available rescue salbutamol

There are economic implications of this work. In 2011, over 45 million prescriptions for inhalers cost the NHS £900 million.[3] More efficient management[5] has saved in excess of £14,000 per annum for NNE

Figure 2 Interventions across care homes (n=117)



CCG. The impact on admissions from care homes will be reviewed in 2017.[7]

Conclusions

Training sessions reduce inappropriate prescribing and promote knowledge and confidence among staff in managing respiratory conditions.[9] Discussion needs to take place with the local long-term conditions nurse, community respiratory nurses and general manager of local partnerships to highlight the needs of respiratory patients and the ongoing training needs of our care workforce.[7] This initiative has brought better management to vulnerable elderly people in our community and we will continue enhancing current achievements.

Recommendations

- Management plans should be given to all care home respiratory residents which can override the MARS chart.
- Refresher inhaler training should be available for all care home staff.[8]
- A care home respiratory care sheet should be implemented supporting communication and care between care homes and GPs. The care sheet should include diagnosis, date of last review including inhaler technique check.
- Review admission data to observe impact of intervention on winter admissions.

Acknowledgements
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PCRS-UK Affiliated Groups

With an increasing workload and fewer staff, it has never been more important to find ways of supporting each other through PCRS-UK affiliated groups


Carol Stonham PCRS-UK Nurse Lead and **Tricia Bryant**, Operations Director

The warning signs have been around for a long time, but the depth and scale of the environment in which primary care clinicians are working is now generally recognised as critical. A King's Fund report[1] found that, during 2010–15, the number of GP consultations increased by 15% but the GP workforce grew by only 4.75% and the practice nurse workforce rose by only 2.85%. Funding for primary care as a share of the general NHS budget fell every year, from 8.3% to 7.9%.

Beccy Baird, fellow at the King's Fund and lead author of the report, said: "Investment alone won't help the crisis in general practice. To avoid the service falling apart, practical support to do things differently is crucial and must be underpinned by an ongoing understanding of what is driving demand and activity."

The report warned that GP shortages are likely to get worse, as it found that only one in 10 GP trainees plan to work in general practice full time and GPs are increasingly retiring early, with 46% of GPs leaving the profession aged under 50. And in a report published in *Pulse*,[2] Dr Peter Swinyard, Chairman of the Family Doctor Association, warned of a 'demographic time bomb' among practice nurses: "GP practices are going to lose a shedload of practice nurses in their fifties over the next five years just due to natural retirement".

So, with an increasing workload and fewer staff, it has never been more important to find ways to support, encourage and motivate staff. We should never forget how rewarding it is to help people to feel better, and it still is an honour to play such an important role in the management of long-term conditions; we know if we do it right we can have a very real and beneficial impact on the lives of our patients. However, it is just as important that we look after and support our colleagues and peers, particularly in these challenging times.

The NHS Employers website (http://www.nhsemployers.org/your-workforce/retain-and-improve) emphasises that retaining the valuable members of the practice staff in whom the practice has invested is a key element to meeting the challenges surrounding workforce supply. Their website provides tools and information on events to support the workforce and reminds us that having engaged, healthy staff leads to increased productivity and an overall happier workforce.

Why run a local affiliated group?

- It develops your personal and professional skills
- It is an opportunity to share best practice with and learn from your peers and local practices
- It supports improved respiratory care in your area
- It helps to facilitate local education relevant to your clinical practice
- It helps colleagues to support each other and feel valued and helps decrease the feelings of isolation that can exist when working in primary care
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- Affiliation with PCRS-UK offers enhanced credibility to the group, access to the other group leads and free membership for group leaders.
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Being a part of a local group or network can help healthcare professionals to share problems, discuss tools and techniques to address issues, share best practice and, as importantly, help colleagues to feel

valued and understood. Beyond this, groups support professional and personal development.

In this year's programme of Affiliated Group activities we will be exploring ways in which PCRS-UK affiliated group members can better support each other, explore new ways of sharing best practice and managing long-term respiratory conditions through technology and other innovative programmes and to value each other more. We will also be looking at ways in which you can protect your groups and ensure their longer term survival beyond the enthusiasm of specific individuals.

In 2017 we are also looking to develop our web pages to help support our affiliated groups with information on tools and resources you can share locally with your groups and other ideas for sharing best practice.

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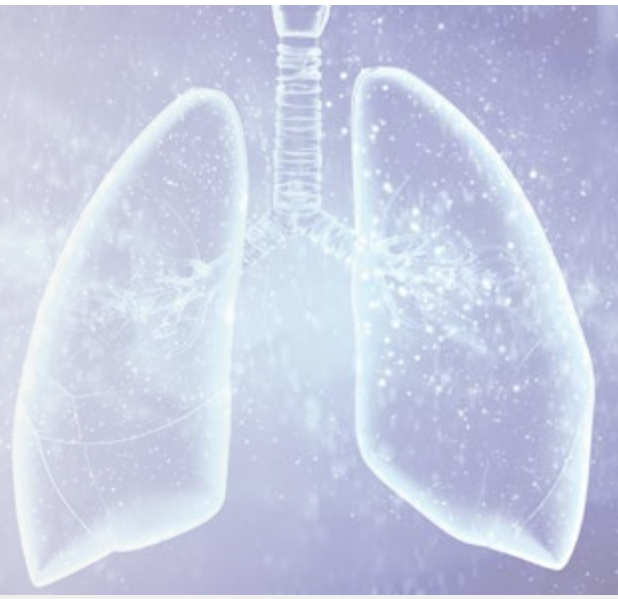

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CASE-BASED LEARNING OPEN

A young child with a history of wheeze

James Paton[1], Patrick Bindels[2], Ann McMurray[3], Jodie Biggins[4], Rebecca Nantanda[5] and Marianne Stubbe Østergaard[6]

The parents of a 3-year old boy are anxious about their son who has recurring episodes of wheezing. They are frustrated that no one seems to be able to give them answers to their questions and would like a referral to a specialist. Does their son have asthma and what is the prognosis; how can the recurrent wheezing be managed and can the risk of asthma be reduced; are there lifestyle changes that could improve the environment and avoid triggers? Communication and support from the family practice team were essential. Listening to the parents' concerns, explaining the diagnostic uncertainty, being realistic about what drug treatments could achieve, and providing practical advice on inhaler use and trigger avoidance reassured the parents that there was a strategy for managing their son's wheeze. The specialist referral was postponed.

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Case study

- The parents of a 3 year old boy have come to see their family doctor about their son whose recurrent episodes of wheeze and respiratory symptoms are causing concern. They are frustrated that no-one seems able to give them a clear diagnosis, and worried because the treatment they have been given is not controlling his symptoms. They would like a referral to a specialist to see if they can get some answers.
- Looking back through the records, the first episode of wheeze was at the age of 6 months. This was diagnosed as bronchiolitis and resulted in a brief admission. He had one further admission the following winter that was labelled as 'viral associated wheeze', and two subsequent attendances at the emergency department, on the last occasion being told that he had 'asthma'. In addition there are six primary care consultations for 'wheeze' or 'chest infections'. These episodes have been variously treated with bronchodilators, steroids (inhaled and oral) and/or antibiotics—none of which have had any convincing effect.
- He was a normal full term delivery and thrived well from birth. Mother had hay fever as a teenager, and father smokes (though 'never in the house')

A clinical case, such as this 3-year old boy with recurrent wheeze, raises many questions that need to be explored in order to address parental concerns and manage the child's condition. The boy is thriving, height and weight just above the 50th centile.

WHY DO THE PARENTS REQUEST A REFERRAL?

A host of reasons may underpin the parent's request. Is their concern that the wheezy episodes are harmful? Are they unable to sleep because the child is disturbed at night? Is it the lack of a clear diagnosis and uncertainty about the boy's long-term prognosis that is causing the worry? Do the parents want advice on avoiding triggers or information on what to do when the wheezing recurs, or is the main focus of this consultation the (perceived) additional value of a referral to a specialist? Or all of these?

DOES OUR SON HAVE ASTHMA, AND WHAT IS THE PROGNOSIS?

Wheezing is common in young children

Wheezing in children under 3 years of age is common. By 30 months, 26% of children in a UK birth cohort (ALSPAC, Avon longitudinal study of parents and children) had wheezed in the previous 12 months.[1] Wheezing, as in this case, is often not just a minor inconvenience. Data from the latest British Thoracic Society national paediatric audit of wheezing/asthma showed that 24% of all the children admitted to hospital were between 12 and 24 months, boys outnumbering girls in a ratio of nearly 2 to 1.[2]

Longitudinal birth cohort studies have transformed our understanding of wheezing in early childhood,[3] demonstrating that the origins of most asthma lie in early childhood and that variations in the natural history of childhood wheezing are associated with different long-term outcomes. Between 4–6 of these 'phenotypes' have been identified.[4, 5] One major group is transient early wheezers whose symptoms remit by the time the child is school age. The absence of atopy is, at present, the best marker for this group.[5] Early onset of wheezing is associated with lower lung function at adolescence and the presence of atopy is associated with persisting asthma.[4] However, at present, it is not possible to assign a particular phenotype to an individual child to determine either treatment or prognosis; indeed, it is common for the features to change during early childhood.[5] A summary of the recent evolution of the terminology of 'asthma' in children is given in Table 1.

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Table 1. Asthma: What's in a name?

Historically, there has been a reluctance to diagnose asthma in children. In 1983, Speight et al., highlighted that children who were not given a diagnosis of asthma were not treated appropriately and suffered unnecessary morbidity.[i] Fears that the label of 'asthma' might cause distress were unfounded; parents were 'uniformly relieved' that the cause of their child's symptoms had been identified. There followed a drive to reduce under-diagnosis and under-treatment, though the status of wheezy infants (under 1 year of age) remained contentious.[ii, iii] Studies of the natural history of asthma in children,[iv] however, began to define phenotypes of 'transient early wheezers', 'late-onset wheezers' and 'persistent wheezing' which seemed to contradict the drive to 'encourage healthcare professionals to make a positive diagnosis of asthma whenever recurrent wheezing, breathlessness and cough occur',[iii] by suggesting that only a minority of wheezy toddlers would prove to have persistent asthma. The concern now was over-diagnosis and over-treatment of young children with guidelines highlighting the 'difficulty of making a confident diagnosis of asthma in young children.'[v]

In some healthcare contexts under-diagnosis of asthma remains a problem, as respiratory symptoms are routinely labelled (and treated) as pneumonia,[vi] or described symptomatically to avoid the perceived stigma of the label 'asthma'.

This case study has adopted a pragmatic approach, sharing uncertainties of diagnosis and prognosis with the parents, objectively monitoring trials of treatment so that symptoms that can be treated are relieved, a strategy that resonates with the contemporary approach of 'treatable traits'.[vii]

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Table 2. Parents interpretation of children's respiratory symptoms.[6]

A study in the East end of London, invited parents (first language English, Urdu, Bengali (Sylheti), or Turkish) to view a video of children's respiratory symptoms:

- A third of parents use other words for wheeze; a third falsely label other sounds as wheeze
- Compared to other respiratory sounds, parents are more likely to label wheeze correctly
- Parents are better able to locate sounds than to label them
- There was no significant difference between parents of wheezers and non-wheezers in accuracy of labelling of location
- Parents are better at labelling if English is their first language

Defining 'wheeze' is not always simple

Wheezing is usually associated with airflow obstruction and is central to the diagnosis of asthma. In older children, airflow obstruction and reversibility can be documented objectively on spirometry or peak flow measurements, but lung function measurements in children younger than 4–5 years are usually not feasible in clinical practice. This places much greater emphasis on the history of wheezing provided by the parents/caregivers, which is problematic because what parents and doctors mean by 'wheezing' is often very different.[6, 7] (See Table 2). Furthermore, the word 'wheeze' does not exist in some languages. Because of this most guidelines emphasise that if a doctor hears wheezing on auscultation, it is an important observation to record.

All that wheezes is not asthma

Not all wheezing is due to asthma or viral infections. There are rare but important differential diagnoses.[8] Persistent wheezing in young children, wet cough, vomiting, failure to thrive and a poor response to anti-asthma medications may be important clues to alternative diagnoses such as cystic fibrosis.

Viral wheezing and asthma

Viruses have been found in at least 80% of wheezing episodes in children.[9] With the exception of respiratory syncytial virus (RSV) in infants hospitalised with bronchiolitis, human rhinovirus (HRV) is by far the most common virus isolated in children over 12 months.[10] HRV-C is the most common rhinovirus species in wheezing children, and, compared to other viruses, is more often associated with recurrent acute wheezing attacks severe enough to result in children presenting to hospital.[11] In the follow up of a high-risk birth cohort (one parent with positive skin prick test to an aeroallergen and/or asthma) the persistence of asthma at age 13 years was most strongly associated with rhinovirus-associated wheezing illnesses and with aero-allergen sensitisation in early life.[12] Evidence suggests that some children are more susceptible and have more severe rhinovirus infections because of a subtle defect in innate anti-viral immunity.[13]

Bronchiolitis and the link with asthma

In the first year of life, bronchiolitis (usually defined as the first episode of wheezing in children less than 2 years old)[14] due to RSV infection is the commonest lower respiratory tract illness with wheezing, affecting around 1 in 3 children.[15] On auscultation there is wheezing and/or fine crackles. The disease is usually mild with only 2–3% of children being hospitalised.[14]

An association between bronchiolitis and asthma has been noted in many studies. However, while longitudinal follow-up suggests that RSV infections in early childhood are associated with an increased risk of wheezing, this association subsides with age and becomes insignificant by 13 years, unlike rhinovirus infections where the association with wheezing persists.[16]

Will symptoms persist in the long term (the prognosis)?

For some children, early wheezing will translate into long-term asthma. This is particularly the case for those with early rhinovirus infections, with sensitisation to aeroallergens and with reduced lung function. The problem is that we cannot, with complete certainty, identify those in whom symptoms will persist and those in whom they will remit. Nevertheless, in the child in our case study, the early frequent and severe episodes in a child with a maternal history of hay fever and possible exposure to environmental smoke may point to a more protracted course of the respiratory symptoms.

Although not widely used in clinical practice, several asthma prediction scores have been developed and published in the last decade,[17] and may usefully inform the history that the healthcare professional needs to take. The clinical asthma prediction score (CAPS), designed specifically for use in general practice, is based on five parameters: age, family history of asthma or allergy, wheezing-induced sleep disturbances, wheezing in the absence of colds, and (if available) specific Immunoglobulin E.[18] The score ranges from 0 to 11 points; CAPS <3 signifies a negative predictive value of 78% while CAPS ≥7 signifies a positive predictive value of 74%. Measurement of specific IgE provides additional value, though the downside is the need for a blood test in a young child.

Prognosis for the 3 year old boy in the case study

Based on the available information, the score in this boy will be at least three (asthma probability 30% at school age) but, with additional information on specific IgE and sleep disturbances, could be as high as nine (asthma probability of 82% at school age). These CAPS scores suggest a policy of either watchful waiting (asthma probability 30–60%) or initiating formal asthma management (asthma probability of 60% or higher).[18] The wide range reflects the current difficulties in predicting prognosis.

WHAT TREATMENT WILL REDUCE OUR SON'S SYMPTOMS—AND, IF POSSIBLE, PREVENT LONG-TERM ASTHMA?

At present, there is no treatment known to 'cure' asthma. Current treatments, however, can control symptoms and modify the chances of attacks.[19, 20] Bronchodilators should be used when the child is wheezy, though discussion with parents is important to ensure they are interpreting sounds correctly and that the child responds to the broncholdilator. If asthma is probable, inhaled steroids are the most effective treatment for controlling symptoms and should be first-line treatment if attacks are frequent and severe and/or if there are interval symptoms. Perhaps the one clear 'fact' is that complete avoidance of exposure to environmental tobacco smoke is important.[21]

Does preventing RSV infection reduce risk of asthma?

Reflecting the observation that the persistence of wheezing beyond childhood is associated with rhinovirus infection (as opposed to RSV), prevention of RSV infection does not have a measurable effect on subsequent episodes of wheeze and asthma.[22] Giving pre-term infants anti-RSV antibodies for the first year of life reduces RSV infections but not recurrent wheeze over the pre-school years.[23]

Does early start of inhaled steroids prevent risk of asthma?

In 2006 three studies were published on the use of inhaled corticosteroids (ICS) in young children at high risk of developing asthma with one or more episodes of wheeze.[24–26] Although some children had a temporary reduction in symptoms during ICS treatment, this did not prevent development of asthma. So, in our clinical case, it is important to discuss with the parents that the early start of ICS is not needed as a primary prevention strategy but it might have an effect on the severity of the symptoms.

Relief of acute wheezy episodes

Let us consider that the consultation for this boy and his parents was triggered by a further attack of respiratory symptoms and wheeze. If there are no alarming symptoms, such as respiratory distress, requiring immediate intervention and/or referral, the use of a short acting beta$_2$ agonist (SABA) will be the drug of choice to relieve the acute wheeze.[8] Symptom relief is the main goal; SABA do not alter the natural course of the wheezy episode.

SABA can be administered safely and effectively at all pre-school ages, including below the age of one. Inhalation is well tolerated and an effect can be expected within 10–15 min. If necessary, inhalation of SABA (with a face mask) during the consultation may provide prompt relief of symptoms, demonstrating both how inhaled medication should be delivered by a spacer (five breaths to one puff) and the rapid symptom response that can result. A dose of a SABA may be needed every 3–6 hours for one or more days until the symptoms of wheeze disappear.

It is essential to ask the parents to revisit your practice at the end of the episode of respiratory symptoms (normally 1–2 weeks after the first visit). During this review the effect of the medication can be evaluated, and in case of complete remission of the symptoms medication should be stopped in order to prevent unnecessary use and overtreatment with SABA in the future. Furthermore, the parents can be advised on when to visit the practice again in case new symptoms appear.

Prevention in children with frequent wheezy episodes or a higher probability of asthma

The indication for treatment with ICS (step 2 in GINA; see Fig. 1) is based on the frequency and severity of symptoms, and the probability that the child has asthma. The older the child, the presence of a multiple trigger wheeze and the presence of a positive specific IgE test to house dust mite, cat or dog allergens (or a positive family history for asthma and /or allergy) will increase the chances of a response to regular treatment with an ICS.

Treatment with ICS should be started as a carefully monitored diagnostic trial,[27] and the clinical effect evaluated after 4–8 weeks.[28] If the child responds well to a treatment with ICS, it is recommended, in discussion with parents, to reduce and ultimately withdraw the medication to exclude natural resolution of symptoms. If symptoms recur during or after withdrawal, restart treatment and consider on-going treatment.[8, 29] If there is no response to treatment, the ICS should be stopped and alternative diagnoses should be reconsidered.

The use of ICS in children with viral induced episodes of wheeze, without symptoms or triggers in between episodes, is more controversial. The effect on symptoms is at best limited, but a recent meta-analysis has shown that short-term (7–10 days) high dose ICS, starting at the first sign of an URTI, may reduce the risk of severe exacerbations.[20]

A follow-up consultation in general practice is essential when inhalation medication is started in any child irrespective of the indication. During this review, the parents can be informed about the short and long-term prognosis and the action to take during a subsequent episode. Prevention of overtreatment of children with ICS and the (in)correct labelling of wheeze as asthma is as important as overlooking an asthma diagnosis and not treating with ICS. Until an asthma diagnosis is confirmed by a physician, requests for repeat prescriptions of SABA or ICS in preschool children should trigger a review of current status.

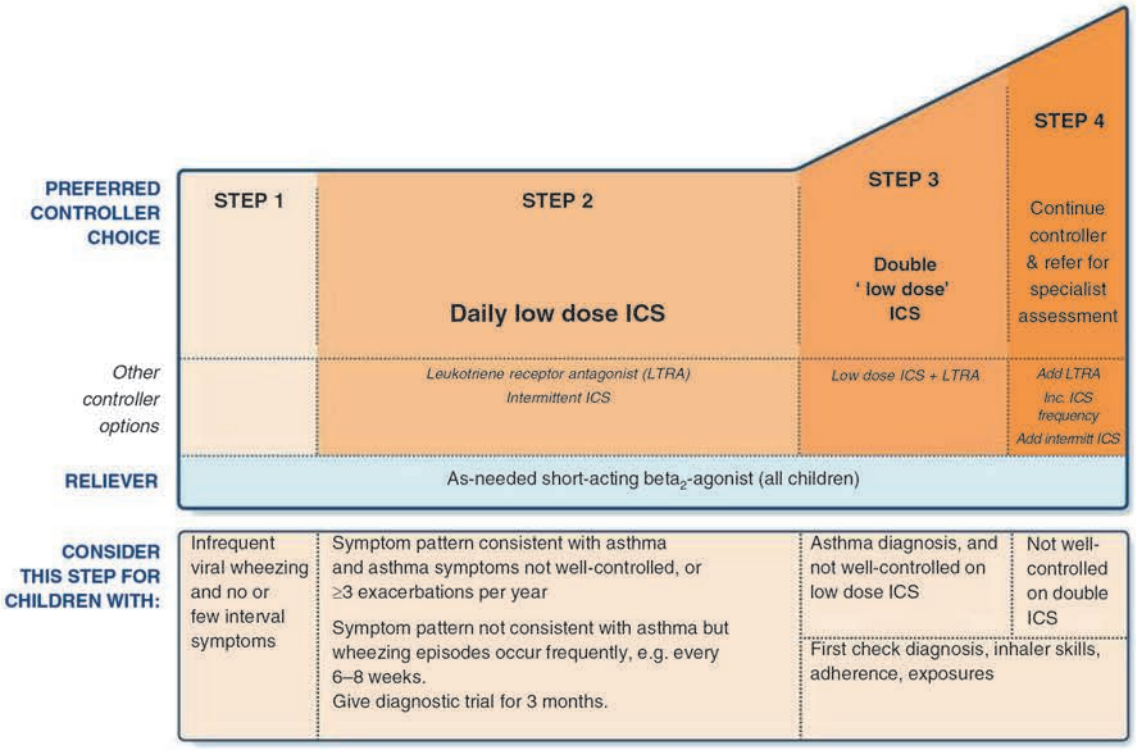

Fig. 1 Stepwise approach to pharmacotherapy in children under 5 years. Reproduced with permission from the GINA guidelines.[8]

Other medication that may be considered

Oral steroids during attacks do not seem to be effective in preschool children with viral induced wheezing of moderate severity.[30, 31] They should be used only in children with severe wheeze, and even then the evidence is not robust.[19]

A recent Cochrane review revealed no benefit from the use of leukotriene receptor antagonists (LTRAs) in pre-school children with viral induced wheeze. However, identifying these phenotypes is challenging, and individual children may warrant a carefully monitored trial of a LTRA.[32] Long acting beta$_2$-agonists (LABA) have been studied in older children with persistent asthma as add-on therapy to ICS. There are no studies on the use of LABA in preschool children with recurrent wheeze and therefore their use cannot be recommended.[33]

Management strategy in the 3 year old boy in the case study

In this particular case, the GP will need more than one review visit before a clear clinical picture will emerge and before the parents can be informed about the likely prognosis of the respiratory symptoms in their child. The parents reported that inhaled steroids did not have a convincing effect, but parental expectations need to be discussed (e.g. ICS will not reduce the frequency of viral upper respiratory tract infections), and inhaler technique and compliance with the trial of treatment needs to be checked and discussed (see below). If the child is currently symptomatic a further carefully monitored trial of ICS should be considered, if they are asymptomatic a wait-and-see strategy may be appropriated. In either situation, even after reassurance of the parents either by the General Practitioner (GP) and the practice nurse, a referral to a specialist may sometimes be appropriate as the most effective way to reassure the parents. Depending on resources in primary care, however, a paediatrician may not have more diagnostic or therapeutic possibilities in preschool children than a general practitioner.

SUPPORTING WORRIED PARENTS

Diagnostic uncertainty & dealing with parental anxiety

It is recognised that approximately one in three children has at least one episode of wheeze before their third birthday,[1, 3] with the expectation that the majority of children will outgrow their symptoms between age 3 and 8 years.[1, 3, 34, 35] This however provides little comfort to a parent whose child is exhibiting symptoms and experiencing exacerbations (see a perspective from a parent in Table 3). It is important to explain that diagnosis is based on the clinical history, symptoms and response to treatment, and that these will need to be carefully observed and re-considered over time.

Treatment has to be tailored to the individual child. Parental acceptance that not all asthma therapies will prove effective in reducing exacerbations can be hard to achieve. Explanations of pharmacological treatment limitations may help to achieve more realistic expectations. Some parents may need longer consultations or will benefit from a referral to other members of the healthcare team such as the health visitor, asthma educator, respiratory nurse, physiotherapist, or community health worker. Education needs to be provided in plain language, using pictures or models to illustrate, and tailored to the parents' current understanding and beliefs. Parents may also benefit from speaking to other parents who have been in a similar situation and they may seek this type of support via social media such as Facebook or Twitter. Parents should always be cautioned

Table 3. Perspective from a parent

Getting a diagnosis

It started with bronchiolitis in autumn when my son was under 2 years old however he had subsequent wheezy episodes over winter and spring and the diagnosis changed to viral induced wheeze. Depending on who we see, either in accident and emergency, GP practice or hospital consultant some say he may have asthma and others say he is too young to have asthma. That has left us as parents frustrated. We have a family history of asthma so it could be that.

Medications

When my son has a wheezy episode we have a plan to follow which was given to us by the respiratory nurse specialists at the hospital. It gives us guidance on what to do when he gets a cold and when we need to see someone. Prednisolone seems to work but he has had so many courses over the last year some of the doctors have started to admit him and monitor him instead without giving steroids.

Giving the inhaler through the spacer with mask has been challenging. Sometimes nurses don't do it correctly or are in a rush to give all 10 puffs. This has scared my son in the past but he got used to it over time. We know that if he is crying or upset he won't get a full dose so it is important to keep him calm. We learned some distraction techniques from the nurse specialists and they have been helpful.

Impact on family life

We have been to see our general practitioner, accident and emergency department, or hospital consultant on many occasions. The unpredictability of the episodes has made it difficult for us to make family plans especially for a holiday. We ended up in hospital on two occasions when we were away from home. We have had to take time off when he is unwell as he cannot go to nursery and this has had an impact on our jobs. Medical staff keep saying it will get better as he gets older.

Table 4. Useful websites for families of wheezy children

Organisation	Website	Description
Asthma UK	www.asthma.org.uk	Advice and support parents need to help their child stay well with their asthma
Chest Heart & Stroke Scotland.	www.mylungsmylife.org	Information, tips and advice to help parents make choices about their child's asthma
Children and Young Peoples Allergy Network Scotland	www.cyans.org.uk	The 'families' section gives basic information on the different types of allergy and how to manage allergies
European Lung Foundation	http://www.europeanlung.org	Reliable information about a range of lung diseases and their risk factors

about the use of less reputable sources of self-help and encouraged to discuss strategies for self-management with their own doctor or nurse. Table 4 lists some useful websites for families.

Inhaler technique

The first experience of administering inhaled medication via a spacer can have an impact upon the child's acceptance of future treatment. The spacer is often used for the first time when the child is experiencing difficulty breathing. Having a facemask placed over their nose and mouth can be frightening. Prior to first use the child should have an opportunity to handle the spacer and build up to the facemask being kept in position for up to 10 s dependant on taught technique. Between wheezy episodes parents should ensure their child remains familiar with the spacer to try and avoid future distress. Although actively accepting an inhaler should be the goal, administering treatment while a child is sleeping is a practical strategy that may help in some situations. Small children should never be chastised or wrapped in blankets or towels to aid with inhaler administration and these methods should be replaced with praise and distraction techniques. Holding techniques should be demonstrated and parents should be signposted to websites with demonstration videos as reminders (for example: Asthma UK 'Using your inhalers' https://www.asthma.org.uk/advice/inhalers-medicines-treatments/using-inhalers). Inhalers (and spacers) should only be prescribed after patients have received training in the use of the device and have demonstrated satisfactory technique.[27] If this is difficult in a time-limited consultation, arrangements may be made with a local community pharmacist, healthcare assistant, health educator or practice nurse to check inhaler technique when inhalers have been prescribed.

Self management

There is a paucity of evidence about effective self-management strategies for parents of pre-school children.[27] Parents often report that their child's condition seems to decline rapidly, but it is important to discuss symptoms or behaviours exhibited in the day (s) prior to previous exacerbations. On reflection, parents may be able to identify non-specific signs (such as decreased dietary intake, runny nose) as a precursor to an attack. Recognition of the signs of increased work of breathing should be discussed with parents and thresholds set for medical review. This may need to be adapted dependant on family dynamics, geographical location and severity of previous attacks. Safety is paramount and parents should not be made to feel they are over reacting or seeking too many medical reviews; they must feel confident to seek help at crucial times.

CREATING A HEALTHY ENVIRONMENT

This is a 3-year old child with recurrent episodes of wheezing. The health care professional has a responsibility to help parents create a healthy environment by addressing any modifiable risk factors such as tobacco and biomass smoke, in-door allergens, house dampness and also to provide information about inevitable respiratory viral triggers of asthma exacerbations.

Environmental risk factors for asthma exacerbations

The link between the environment and exacerbation of asthma symptoms is a well-described entity.[8] Many studies have described the role of air pollutants (indoor and outdoor) including biomass smoke and fumes from cars and factories, in triggering asthma symptoms.[36, 37] The effect of environmental tobacco smoke, also known as second-hand smoking in causation

and exacerbation of asthma symptoms in children is also well-documented.[38–40]

Children exposed to environmental tobacco smoke, experience more frequent and severe exacerbations of the asthma symptoms, even where medical treatment is adequate.[37, 40] The dust and surfaces in a smoker's home have been found to be contaminated with tobacco smoke, even when parents avoid smoking in the house.[41] Vapour phase nicotine and particulates have been also found in the home of smokers.[42, 43] Generally, contamination and exposure to second-hand smoke are 5–7 times higher in the homes of 'smoking outdoor' people compared to non-smokers.[41]

Indoor air pollution, including use of biomass smoke from burning wood, animal dung and crop residues for cooking and heating, has been associated with an increased risk of asthma exacerbations in children and adults.[36] Therefore, improving air quality at home and reviewing some of the activities that may trigger attacks will be an important aspect of creating a health environment for this child.

Besides air pollution, a consistent association of dampness with respiratory symptoms is found among both atopic and non-atopic children. House dust mite exposure and sensitisation may contribute, but the link seems to be related principally to non-atopic mechanisms.[44] Moreover, indoor allergens from mouse, cats, pets, dust mite and mould have been described as important exposures that lead to exacerbation of asthma symptoms.[44, 45]

What can be done to create a healthy environment for this child?

As the diagnosis of asthma is increasingly likely, ICS along with addressing modifiable environmental risk factors for exacerbations (particularly tobacco smoke), can reduce hospital visits, avoid high healthcare costs and improve quality of life of the child and his parents.[46, 47] The parents need to understand the benefits of the lifestyle changes and should be motivated to creating a smoke-free home, without exceptions for guests or friends.

Smoking cessation is a complex process and the parents will need support from family, friends and the healthcare system to be able to stop smoking. Key to this process is an understanding the barriers to smoking cessation such as; parental beliefs about second-hand smoke and readiness to quit smoking. Stress has been described as a major barrier to quitting because cigarette smoking is often used to give (temporary) relief from stress.[48] It is therefore important to discuss the sources of stress and coping strategies that are not harmful. It is also important to build on known motivators for smoking cessation including family support and the will to protect the child from the effects of tobacco smoke.[49]

Reduction in exposure to biomass smoke can be achieved through use of alternative cooking and heating fuel such as liquefied gas or by using improved cookstoves.[50] However, the challenges in adopting such changes including costs involved and behavioural aspects must be discussed with the parents.[51]

Many children are sensitised to more than one allergen, and many households have damp rooms. Reducing exposure to damp and mould improves asthma control in adults, but the benefit of interventions such as regular cleaning, avoiding use of carpets, and withdrawing pets from the home,[43] is described as 'limited' in guidelines and can be 'expensive and complicated'.[8]

The story continues…

- The family doctor recognised that the parents needed time to discuss their concerns and to have answers to their questions. She spent the consultation listening to the story of admissions and on-going symptoms, and explained why there was uncertainty about the diagnosis and why the treatments that had been tried had not relieved all the symptoms. She arranged for the parents to meet with a specialist nurse who had expertise in managing pre-school children with asthma. At the review, the nurse was able to reinforce the information provided by the doctor, review (self) management strategies, offer practical advice on delivery of inhaled therapy, and discuss reducing environmental triggers (including offering the father support with smoking cessation). At a follow-up appointment a month later, although their son continued to have occasional symptoms he was still thriving, and the parents decided against another trial of ICS at this time. The parents felt reassured and supported, and the decision about a referral to a hospital clinic was postponed

AUTHOR CONTRIBUTIONS

J.P., P.B., A.McM., R.N., M.S. contributed sections of the text, commented on the collated document, and approved the final version. J.B. contributed the patient perspective supported by A.McN. The handling editor (Hilary Pinnock) collated and edited the individual sections.

COMPETING INTERESTS

The authors declare that have no competing interests.

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Once control of asthma is attained treatment should be reviewed and consideration given as to whether titrate downwards the dose of inhaled corticosteroid as appropriate to maintain disease control. AirFluSal is not available in any strengths lower than salmeterol 50 mcg/fluticasone propionate 500 mcg per metered dose. Therefore, when titrating down to a lower strength, a change to an alternative fixed dose combination of salmeterol and fluticasone propionate containing a lower dose of the ICS is required. COPD: one inhalation b.d. of AirFluSal Forspiro 50/500. *Paediatric population:* not recommended for either children or adolescents. Contraindications: Hypersensitivity to the active ingredients or to any of the excipients. Precautions: Pulmonary tuberculosis, fungal, viral or other infections of the airway, severe cardiovascular disorders, heart rhythm abnormalities, diabetes mellitus, hypokalaemia and thyrotoxicosis. An increase in the incidence of pneumonia, including pneumonia requiring hospitalisation, has been observed in patients with COPD receiving inhaled corticosteroids. Physicians should remain vigilant for the possible development of pneumonia in patients with COPD. Risk factors for pneumonia in patients with COPD include current smoking, older age, low body mass index (BMI) and severe COPD. Paradoxical bronchospasm post-dose. *Severe unstable asthma:* Warn patients to seek medical advice if short-acting inhaled bronchodilator use increases. Consider increased inhaled/additional corticosteroid therapy. *Acute symptoms:* Not for acute symptoms. Use short-acting inhaled bronchodilator. *Systemic effects:* Systemic effects of inhaled corticosteroids may occur, particularly at high doses for prolonged periods, but much less likely than with oral corticosteroids. May include Cushing's syndrome, cushingoid features, adrenal suppression, adrenal crisis, growth retardation in children and adolescents, decrease in bone mineral density, cataract, glaucoma and, more rarely, a range of psychological or behavioural effects including psychomotor hyperactivity, sleep disorders, anxiety, depression or aggression. Tremor, palpitations and headache, have been reported with β_2-agonist treatment. In asthma, therapy should be down titrated under physician supervision to lowest effective dose and treatment should not be abruptly stopped due to risk of exacerbation. Serious asthma-related adverse events and exacerbations may occur during treatment with AirFluSal. Patients should not be initiated on AirFluSal during an exacerbation or if they have significantly worsening or acutely deteriorating asthma. Data from a large clinical trial suggested patients of black African or Afro-Caribbean ancestry were at increased risk of serious respiratory-related events or deaths when using salmeterol. All patients should continue treatment but seek medical advice if symptoms remain uncontrolled or worsen when initiated on AirFluSal or using AirFluSal. In COPD cessation of therapy may also be associated with decompensation and should be supervised by a physician. *Transfer from oral steroids:* Special care needed. Consider appropriate steroid therapy in stressful situations. Drug interactions: Avoid beta-blockers. Avoid concomitant administration of ketoconazole or other potent (e.g. itraconazole, telithromycin, ritonavir) and moderate (erythromycin) CYP3A4 inhibitors unless benefits outweigh potential risk. β_2 adrenergic blockers may weaken or antagonise the effect of salmeterol. Potentially serious hypokalaemia may result from β_2-agonist therapy, particular caution is advised in acute severe asthma. This effect may be potentiated by concomitant treatment with xanthine derivatives, steroids and diuretics. Pregnancy and lactation: Experience limited. Balance risks against benefits. Side effects: *Very Common:* headache, nasopharyngitis. *Common:* candidiasis of the mouth and throat, hoarseness/dysphonia, throat irritation, pneumonia (in COPD patients), bronchitis, hypokalaemia, sinusitis, contusions, traumatic fractures, arthralgia, myalgia, muscle cramps. *Uncommon:* respiratory symptoms (dyspnoea), anxiety, tremor, palpitations, tachycardia, angina pectoris, atrial fibrillation, cutaneous hypersensitivity reactions, hyperglycaemia, sleep disorders, cataract. *Rare:* angioedema, respiratory symptoms (bronchospasm), anaphylactic reactions including anaphylactic shock, Cushings syndrome, cushingoid features, adrenal suppression, growth retardation in children and adolescents, decreased bone mineral density, oesophageal candidiasis, behavioural changes including psychomotor hyperactivity and irritability, glaucoma, cardiac arrhythmias and paradoxical bronchospasm. *Not known:* depression or aggression. *Paradoxical bronchospasm:* substitute alternative therapy. Prescribers should consult the SPC in relation to other adverse reactions Legal category: POM. Presentation and Basic NHS cost: AirFluSal Forspiro 50/500 60 inhalations. £32.74. Product Licence (PL) no: PL 04416/1431. PL holder: Sandoz Ltd, Frimley Business Park, Frimley, Camberley, Surrey. GU16 7SR. Last date of revision: February 2017. UK/MKT/AFS/17-0007.

Adverse events should be reported. Reporting forms and information can be found at www.mhra.gov.uk/yellowcard
Adverse events should also be reported to Sandoz Ltd, 01276 698020 or uk.drugsafety@sandoz.com

References: 1. AirFluSal® Forspiro® SmPC. 2. HIMS UK December 2016.

[1]AirFluSal® Forspiro® vs Seretide® Accuhaler®.

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