

treatment adjustment, and thresholds to seek medical attention. The findings of Tan *et al.*⁵ also support the findings of previous studies describing increased confidence in asthma management with AAP provision. But an important question remains, namely: does improved confidence translate into better clinical outcomes for children with asthma? Even though this was not the main purpose of this study⁵ it would have strengthened the study's conclusions if the reported benefits of having a WAAP could have been shown to be linked to improved clinical outcomes for the child. We hope that future studies will try and address this aspect.

There are several other interesting areas that remain poorly explored in the literature. Once the child has left the community and/or hospital setting, how do caregivers utilise the AAP with respect to medication adherence and decision-making for treatment and medical review during asthma episodes? How do clinicians utilize AAPs with the intended user? This aspect is of particular relevance in paediatric asthma, since AAP development should focus on optimising the caregiver's understanding of their child's asthma management. The increasing role of IT-based communication should not be ignored, and presents exciting opportunities to improve these aspects. In the interim, it is vital that health professionals continue to provide AAPs containing clear and concise information – in conjunction with appropriate education – to assist children with asthma and their caregivers in developing self-management skills.¹¹

Conflicts of interest The authors declare that they have no conflicts of interest in relation to this article.

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Evaluation of patients with symptoms of chronic lung disease in primary care

See linked article by Lamprecht *et al.* on pg 195

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In this issue of the *PCRJ*, Lamprecht and colleagues have drawn attention to the vexing problem of diagnosing COPD in primary care.¹ Their study highlights the problem of failing to identify and diagnose patients with COPD in this setting. However, it also

demonstrates an alternative problem: incorrectly attaching the label of COPD to patients who do not have the disease. Of course, the key to accurate diagnosis of COPD – as defined by the Global Initiative for Chronic Obstructive Lung Disease (GOLD)² – is correct performance and interpretation of spirometry. Lamprecht *et al.* show us that, although accurate diagnosis of COPD was more likely in patients who reported having performed a lung function test, it was by no means a guarantee of accurate diagnosis. This report leaves open the critical question of whether enhanced lung function testing in primary care is likely to lead to improved outcomes for patients with chronic lung disease. Do we need to develop and evaluate new strategies for appropriate targeting of therapeutic strategies for chronic lung disease in the primary care setting?

The fact that COPD is underdiagnosed in primary care, and in the community at large, is well established in several studies^{3,6} and has become an article of faith within the respiratory community. However, this is unsurprising given that many people in the general population who meet the spirometric definition for persistent airflow obstructive

(that is, a low FEV₁/FVC ratio) do not have symptoms and are unlikely to be assessed for, or diagnosed with, any disease. As there is no evidence that specific therapeutic intervention is beneficial for patients with asymptomatic airflow obstruction, many of these “undiagnosed” cases are not disadvantaged by not having been diagnosed with COPD. More relevant are the patients with symptoms or disability attributable to airflow obstruction – particularly those who have sought medical care for this problem – who have not been diagnosed. I am not aware of published data on the population prevalence of undiagnosed symptomatic COPD, although this information could feasibly be derived from the Burden of Obstructive Lung Disease (BOLD) study.

The converse to the under-diagnosis problem is over-diagnosis. In Salzburg, 48% of all people who reported a COPD diagnosis did not have spirometric evidence of persistent airflow obstruction when tested.¹ This problem has been less widely studied, but in south-west Sydney, Australia, Zwar *et al.* found that only 58% of patients whom GPs identified as having COPD had spirometry consistent with this diagnosis.⁷ A further 4% had reversible airflow obstruction consistent with asthma, and 20% had other spirometric abnormalities, mainly restriction. However, 18% of these patients had entirely normal spirometry. Both studies raise the concern that patients have been exposed to treatments they do not need (with the attendant costs and risks of adverse effects) and have not received effective treatment for the real cause of their symptoms.

Since GOLD defines COPD in terms of spirometry, the diagnosis can only be made after correctly performing and interpreting spirometry. The observed very poor concordance between diagnosis and spirometric findings in many studies strongly implies that the diagnosis is commonly made without the benefit of correctly performed and interpreted spirometry. Although 41% of people aged 40 and over living in Salzburg reported having had lung function measured,¹ as the authors point out this may not be representative of other areas where reimbursement for the procedure is not available or is less generous. The procedure is not as simple as it seems, and interpretation can be problematic. Hence, even where spirometry is performed, it may not be performed and interpreted correctly.⁸ Alternative models, including a centralised spirometry service⁹ and a telemedicine service,¹⁰ have been proposed and implemented. However, a cluster randomised controlled trial performed in general practices in Melbourne, Australia, showed that regular performance of spirometry did not improve health outcomes in patients with asthma and COPD¹¹ – although this study did not directly assess the role of spirometry in initial diagnosis. This may explain the finding that, in the study by Lamprecht *et al.*, among the 17 patients who reported a diagnosis of COPD and also reported that they had had a lung function test in the preceding 12 months, only 10 (59%) actually had persistent airflow obstruction consistent with COPD.¹ Hence, while performance of spirometry is a necessary condition for accurate diagnosis of COPD, it may not be a sufficient condition.

It remains to be seen whether accurate spirometric diagnosis of COPD in the primary care setting substantially improves outcomes for patients. Chronic lung disease in older people is a heterogeneous condition which cannot readily be classified simply as “asthma” or

“COPD”.¹² A diverse range of therapeutic options are available, including (but not limited to) bronchodilator therapy (both β_2 -agonist and anti-muscarinic), inhaled and oral corticosteroids, theophylline and other phosphodiesterase inhibitors, exercise-based pulmonary rehabilitation, long-term home oxygen therapy, enhanced sputum clearance techniques, vaccination against influenza, and a range of novel therapies currently under investigation. The heterogeneity in both the disease and the therapeutic options raises the possibility that these therapies would be used most effectively and efficiently if they were targeted at particular sub-groups of patients with chronic lung disease.

We are only at the beginning of attempts to design disease management strategies in accordance with this model. Measurement of pulse oximetry to identify patients with chronic lung disease who would benefit from long-term oxygen therapy is one example. It seems likely that performing spirometry for the detection of airflow obstruction in symptomatic patients will be most useful for identifying those who will benefit from bronchodilator therapy. However, as yet there are no feasible tests to assist in targeting β_2 -agonist and anti-muscarinic inhaled therapy specifically; nor are there tests that identify who will benefit from any of the other available therapeutic options. In the absence of such tests, available therapies tend to be added to each other in a patient who remains symptomatic, even if one of more of these therapies is not actually helping.

Hence, while improving the performance and interpretation of spirometry among breathless patients who are seen in primary care is a worthwhile objective, we need further research to identify and evaluate new tests that will help primary care doctors to utilise effectively and efficiently all of the therapeutic options that are available for patients with chronic lung disease.

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