Excellent asthma and COPD article

I would like to congratulate Dr Samir Gupta for his excellent Choosing Wisely Canada article[1] pertaining to diagnosing asthma and chronic obstructive pulmonary disease (COPD) and the importance of pulmonary function testing in this context. I have had the pleasure of working with Dr Gupta in areas dealing with this subject and I have learned a great deal from him about the challenges that we face when it comes to diagnosing asthma and COPD in the primary care setting. I would like to take this opportunity to highlight how making choices about approaches to diagnosis of asthma and COPD might be influenced differently based on available data and how these data may or can be applied in the real-world setting. Dr Gupta does an eloquent job highlighting the underuse of spirometry in primary care for objective diagnosis of both asthma and COPD and how this gap may influence patient management.

Dr Gupta highlights that the Canadian Thoracic Society guidelines related to asthma diagnosis and management suggest that simple spirometry should be a first-line test and that asthma diagnosis should include demonstration of a reduction in the forced expiratory volume in the first second (FEV_1) to forced vital capacity (FVC) ratio and an improvement in FEV_1 of at least 12% and 200 mL.[2] Those patients who fail to demonstrate a positive bronchodilator response will then undergo further evaluations, including methacholine challenge testing (MCT). The fact that MCT is a more sophisticated test and difficult to obtain in some situations is a reason for choosing simple spirometry as the initial test for asthma diagnosis. To date there are no reports in the literature highlighting any serious adverse outcomes with the use of MCT in the community setting.

It is not clear why current guidelines[2] recommend demonstration of a reduction in the FEV_1:FVC ratio for asthma diagnosis since most patients with asthma in primary care have normal lung function.[3] Given that asthma is characterized by variable airflow obstruction, the FEV_1:FVC ratio is best described as a moving target often being in the normal range, particularly during periods of minimal disease activity.

Among patients with a self-reported physician diagnosis of asthma and negative bronchodilator response, it has been shown that only 43% had a positive response to methacholine. Another study[4] reported a positive MCT result in 39% of patients with symptoms consistent with asthma and a negative bronchodilator response.

Aaron et al[5] report that asthma diagnosis was confirmed in only 16% of patients with previous physician diagnosis of asthma using postbronchodilator spirometry, and Luks et al[6] found that only 10.8% of comparable patients were diagnosed with asthma using simple pre- and postbronchodilator spirometry. Aaron et al[7] further reported that only 22.5% of patients with suspected asthma fulfilled FEV_1 reversibility criteria. We have reported[8] that among 69 patients with a clinical history compatible with asthma and normal spirometry results that did not fulfil the bronchodilator reversibility criteria, 21 patients (30.4%) had positive MCT results, and 48 patients (69.6%) had negative MCT results. The lower rate for positive MCT results in our study compared with previous studies might be related to the fact that our patients had not had a prior diagnosis of asthma but only symptoms that were compatible with asthma in the primary care setting. In our study, the average time from initial clinic spirometry to MCT was about 32 days in a large urban setting.[8] Given the low yield of simple spirometry in detecting FEV_1 reversibility, inevitably most patients will likely require some other confirmatory test to confirm the diagnosis of asthma.

The findings highlighted above underscore the importance of reminding family physicians of the limitations of simple spirometry for asthma diagnosis and the need for further research related to the feasibility of having access to MCT in the community setting. In order to address the pragmatic challenges family physicians may encounter in the real world related to asthma diagnosis, this may include the development of management strategies that take into consideration the potential lag time from initial presentation to MCT in diverse communities. Dr Gupta has done an exceptional job in highlighting the importance of objective confirmation for asthma diagnosis. I would add that although simple spirometry provides valuable, rapid assessment of lung function in the primary care setting, given the current evidence, I wonder how many very busy family physicians will be convinced to use a test with a negative predictive value that some would consider quite suboptimal as a

diagnostic tool. Even if our colleagues are convinced to use simple spirometry for asthma diagnosis more frequently, how would this solve the bigger problem of confirming the diagnosis for most patients in whom spirometry fails to meet reversibility criteria? Choosing the most appropriate approach for asthma diagnosis in primary care may require the development of more seamless collaborative strategies that include timely access to confirmatory tests in the broader community in order to prevent the problem of asthma overdiagnosis from festering indefinitely.

In Figure 1, Dr Gupta very nicely describes the approach for confirming or rejecting a suspected or clinical diagnosis of COPD when spirometry access is delayed. The final decision nodes in that figure are linked to whether the postbronchodilator FEV_1:FVC ratio is normal or reduced. It might be important to note that in many patients with COPD, although the FEV_1:FVC ratio may remain below a designated cutoff, the FEV_1 may improve by 12% and 200 mL or more—a scenario where the patient meets the spirometric criteria for both asthma and COPD. This will create diagnostic confusion between COPD and asthma, particularly in older patients with respiratory concerns and a background of cigarette smoking (most smokers do not develop COPD) or workplace exposure. The landmark Understanding Potential Long-term Impacts on Function with Tiotropium trial[9] reported that among COPD patients who had no other features of asthma, 53.9% had improvements of at least 12% and 200 mL above baseline in FEV_1 acute bronchodilator reversibility, regardless of the criteria used to define reversibility. In other recent reports, the prevalence of bronchodilator reversibility, expressed as increase in FEV_1 of 12% or greater and 200 mL or greater, was 17.3% and 18.4% among participants with asthma and COPD, respectively,[10] underscoring that FEV_1 reversibility may be of limited value for distinguishing asthma from COPD.[11] These factors emphasize the important comments Dr Gupta outlines regarding the importance of thorough history taking.

—Anthony D. D'Urzo MD MSc CCFP FCFP
Toronto, Ont

Competing interests
None declared

References

1. Gupta S. Diagnosing asthma and chronic obstructive pulmonary disease. Importance of pulmonary function testing. *Can Fam Physician* 2022;68:441-4.
2. Yang CL, Hicks EA, Mitchell P, Reisman J, Podgers D, Hayward KM, et al. Canadian Thoracic Society 2021 guideline update: diagnosis and management of asthma in preschoolers, children and adults. *Can J Respir Crit Care Sleep Med* 2021;5(6):348-61. Epub 2021 Aug 19.
3. Lusuardi M, De Benedetto F, Paggiaro P, Sanguinetti CM, Brazzola G, Ferri P, et al. A randomized controlled trial on office spirometry in asthma and COPD in standard general practice: data from spirometry in asthma and COPD: a comparative evaluation Italian study. *Chest* 2006;129(4):844-52.
4. Tomita K, Sano H, Chiba Y, Sato R, Sano A, Nishiyama O, et al. A scoring algorithm for predicting the presence of adult asthma: a prospective derivation study. *Prim Care Respir J* 2013;22(1):51-8.
5. Aaron SD, Vandemheen KL, Boulet LP, McIvor RA, Fitzgerald JM, Hernandez P, et al. Overdiagnosis of asthma in obese and nonobese adults. *CMAJ* 2008;179(11):1121-31. Erratum in: *CMAJ* 2008;179(12):1301.
6. Luks VP, Vandemheen KL, Aaron SD. Confirmation of asthma in an era of overdiagnosis. *Eur Respir J* 2010;36(2):255-60. Epub 2010 Jan 14.

7. Aaron SD, Vandemheen KL, FitzGerald JM, Ainslie M, Gupta S, Lemière C, et al. Reevaluation of diagnosis in adults with physician-diagnosed asthma. *JAMA* 2017;317(3):269-79.
8. Chen A, D'Urzo KA, D'Urzo AD. Airway hyperresponsiveness in patients with normal spirometry results and symptoms compatible with asthma. Primary care retrospective chart review. *Can Fam Physician* 2021;67:e84-9. Available from: **https://www.cfp.ca/content/cfp/67/3/e84.full.pdf**. Accessed 2022 Aug 16.
9. Tashkin DP, Celli B, Decramer M, Liu D, Burkhart D, Cassino C, et al. Bronchodilator responsiveness in patients with COPD. *Eur Respir J* 2008;31(4):742-50. Epub 2008 Feb 6.
10. Janson C, Malinovschi A, Amaral AFS, Accordini S, Bousquet J, Buist AS, et al. Bronchodilator reversibility in asthma and COPD: findings from three large population studies. *Eur Respir J* 2019;54(3):1900561.
11. D'Urzo AD, Price D, Kardos P, Maleki-Yazdi MR. Importance of distinguishing between asthma and chronic obstructive pulmonary disease in primary care. *Can Fam Physician* 2021;67:661-7 (Eng), e240-6 (Fr).

Can Fam Physician 2022;68:635-6, 638. DOI: 10.46747/cfp.6809635