

## Must family physicians use spirometry in managing asthma patients?

YES

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Asthma is a chronic (often lifelong) yet variable disease that, clinically, often resembles many other similar conditions. Consequently, objective measurements of lung function are necessary for initial diagnosis as well as long-term monitoring. All current asthma guidelines<sup>1-5</sup> recommend this.

### Diagnosis

A typical FP will find 8 new cases of asthma yearly (7 of chronic obstructive pulmonary disease [COPD]) and will manage 50 patients with asthma at any given time (60 with COPD).<sup>6</sup> However, patients present not with diagnoses but with undifferentiated respiratory symptoms. Dyspnea is a common presenting symptom for many illnesses, occurring in 1% to 10% of patients with upper respiratory tract infections and in up to 40% of those with asthma, COPD, or heart failure.<sup>7,8</sup> Cough has many possible causes, including asthma, yet empiric treatment of undifferentiated cough with bronchodilators or steroids is not recommended in the literature<sup>9</sup> or even by Dr D'Urzo.<sup>10</sup> Therefore, although the diagnostic algorithm starts with a thorough history and physical examination (including a discussion of family history, risk factors for respiratory and cardiac diseases such as atopy and smoking, and occupational history), these clinical data are insufficient to diagnose asthma accurately.

Spirometry before and after bronchodilator inhalation is necessary to confirm the diagnosis of asthma and to distinguish it from other obstructive lung diseases. Owing to asthma's variability, a single spirometry test is not always successful in diagnosing or ruling out asthma definitively, but it does allow immediate, objective determination that airflow obstruction is present. In contrast, normal spirometry in the presence of persistent respiratory symptoms should prompt consideration of an alternative diagnosis, such as congestive heart failure, interstitial lung disease, respiratory muscle weakness, obesity-related causes, or pulmonary vascular disease.<sup>11</sup>

Many FPs who do not use spirometry in their offices instead prescribe asthma medications to patients with respiratory symptoms—empirically, indiscriminately, and often indefinitely. Many such patients are thereby labeled as having a chronic disease when none exists and are condemned to potentially lifelong therapy, conferring needless exposure to both possible side effects (albeit usually minor) and costs (which can exceed \$100 per month for a single medication). Otherwise, both underdiagnosis and overdiagnosis of asthma occurs.<sup>12</sup> Symptoms assumed to be due to asthma might instead signify another medical condition that then goes undiagnosed and untreated.<sup>13</sup> Frequently, apparent responses to therapy in patients with self-limiting conditions (eg, upper respiratory tract infections) lead to the incorrect label of asthma. Although guidelines support empiric trials of medications when spirometry is not immediately available,<sup>4</sup> using this strategy to diagnose asthma is only rational if it incorporates objective measurement of treatment response.

### Monitoring

Proper asthma management requires a chronic disease model, yet asthma is often managed as an episodic disease. Canadian guidelines<sup>2</sup> recommend that at follow-up visits clinicians inquire about daytime and nighttime symptoms, use of rescue medication, activity limitations, and missed school or work. However, lung function must also be measured and optimized. Relying on symptoms alone might be insufficient because symptoms are often the first thing to resolve with asthma treatment, while lung function abnormalities, bronchial hyperresponsiveness, and inflammation still persist.<sup>14</sup> Concerns exist that untreated long-term inflammation might produce airway remodeling, leading to fixed airflow obstruction.<sup>15</sup>

Spirometry has other practical values: Although previous studies were inconsistent, a recent trial<sup>16</sup> showed that using spirometry to provide patients with their estimated lung age can assist in smoking

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The parties in this debate refute each other's arguments in rebuttals available at [www.cfp.ca](http://www.cfp.ca). Join the discussion by clicking on **Rapid Responses**.

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cessation. In addition, reversibility testing provides an excellent opportunity to teach and review proper asthma inhaler technique, which is important considering improper technique is a common cause of ineffective asthma control.<sup>3</sup>

**Availability**

While spirometry availability is a common perceived barrier, accurate portable devices allow spirometry to be easily performed in primary care offices. Hospitals, private laboratories, and specialist offices can provide FPs with access to spirometry, but this can involve delays—often long ones. Only when done directly in the practitioner’s office can spirometry provide immediate results and immediate guidance for treatment decisions.

Other acceptable but less optimal asthma tests exist. Peak flow measurement can be used to diagnose asthma; it is simpler and cheaper than spirometry and can be used by patients for self-monitoring at home or in the workplace. However, peak flow measurements provide very limited diagnostic information; unlike spirometers, peak flow meters do not measure flow rates over time or lung volumes. Further, reference values and reproducibility of peak flows vary greatly, making a single reading of limited value. As such, peak flow measurements are not highly reliable in either children or adults,<sup>1</sup> while spirometry is much more accurate. Promising future testing modalities include measurements of airway inflammation with sputum cytology<sup>17</sup> or exhaled nitric oxide.<sup>18</sup>

**Bottom line**

All patients suspected of having asthma should have their diagnoses confirmed with spirometry. If results of spirometry are normal, patients should be referred for challenge testing (eg, methacholine challenge test). This will prevent overtreatment of asthma and, by ensuring adequate control of airway obstruction, will also prevent undertreatment of asthma. To meet this standard of care, all physicians who treat asthma must regularly make objective measurements of lung function. Empiric treatment of presumed asthma is acceptable only if followed by objective measurements of lung function to confirm clinical suspicion.<sup>4</sup>

Symptom-based diagnosis and management of asthma is demonstrably inadequate. When a feasible objective test is readily available—one that can provide your patients with better care—why wouldn’t you use it? 

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**Competing interests**

**Dr Kaplan** is a member of an advisory board for, or has received honoraria from, Astra Zeneca, Boehringer Ingelheim, Glaxo Smith Kline, Merck Frosst, Nycomed, Pfizer, Purdue, and Talecris.

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**CLOSING ARGUMENTS**

- Prescribing asthma treatment to patients with undifferentiated, nonspecific respiratory symptoms based on speculation often leads to incorrect diagnosis and unnecessary long-term exposure to costly medications.
- Spirometry provides a more accurate diagnosis, which is essential to guide therapy and prevent both overdiagnosis and underdiagnosis.
- Spirometry allows for more accurate monitoring of asthma control than does reliance on patient-reported clinical symptoms alone, and therefore can reduce asthma morbidity.
- Spirometry testing before and after using bronchodilators provides an excellent educational opportunity to reinforce proper inhaler technique.

