

## CMEARTICLE

# Does this patient really have chronic obstructive pulmonary disease?

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*Mr Ng chose to transfer his chronic respiratory disease care to your clinic after learning that your clinic participates in the Community Health Assist Scheme (CHAS). You reviewed the transfer medical memo, which stated that Mr Ng was a smoker and required follow-up for the collection of his high-dose inhaled steroids and standby beta agonists (salbutamol) every 1–2 months. You also noted that there were no clear plans or diagnoses stated in the memo, but the visit history recorded for the past two years suggested an increase in episodes of breathlessness.*

## WHAT IS CHRONIC OBSTRUCTIVE PULMONARY DISEASE?

Chronic obstructive pulmonary disease (COPD) is characterised by airflow limitation that is usually progressive, and is associated with an enhanced chronic inflammatory response to noxious particles or gases in the airways and lungs. Exacerbations and comorbidities contribute to the overall severity of the condition in individual patients.<sup>(1)</sup>

## HOW COMMON IS THIS IN MY PRACTICE?

COPD is the fourth leading cause of death in the world and a major cause of chronic morbidity. The disease is also among the top seven causes of hospitalisation and death in Singapore in 2011; the prevalence rates of moderate to severe COPD in Singapore is estimated at 3.5%.<sup>(2)</sup>

## WHAT CAN I DO IN MY PRACTICE?

### Making an early diagnosis

COPD is a preventable and treatable disease. Early diagnosis and appropriate treatment may improve symptoms, reduce the rate and severity of exacerbations, improve quality of life and exercise capacity, and prolong survival in patients.<sup>(3)</sup> Patients in early stages of COPD may have undetected activity limitations, such as walking slower than their peers or experiencing difficulties in performing activities that could easily be completed previously; such limitations may lead to lifestyle changes and deconditioning.<sup>(4)</sup> Hence, early diagnosis is critical in preventing worsening of COPD and reducing the burden of symptoms.

### Clinical features of COPD

Clinical features of COPD include: (a) progressive dyspnoea, which typically worsens with exercise; (b) chronic cough, which may or may not be productive; and (c) risk factors such as passive or active smoking and family history of COPD. The more severe form of COPD is associated with weight loss, anorexia, depression, coronary heart disease, lung cancer and

cognitive dysfunction. Physical examination typically reveals a prolonged expiratory phase in mild cases of COPD and features of hyperinflation as the severity of airway obstruction increases. Spirometry usually shows obstruction (forced expiratory volume in 1 second/forced vital capacity [FEV1/FVC] < 0.7) and no bronchodilator response.

### Misdiagnosis of COPD

It is challenging to diagnose COPD, especially with mimickers such as asthma; a study has shown that primary care physicians have difficulties in correctly classifying up to 19.8% of patients.<sup>(5)</sup> Differentiating between asthma and COPD is important, as the treatment algorithms, choices and objectives differ in each condition.<sup>(6)</sup> In persistent asthma, inhaled steroids are the basis of treatment, while in COPD, bronchodilators are the mainstay of treatment, with inhaled steroids only recommended in patients with severe COPD.<sup>(1,7,8)</sup> However, steroid therapy may come with adverse effects; for instance, a study has shown that there is a higher risk of pneumonia in patients with COPD treated via inhaled steroids.<sup>(9)</sup> Misdiagnosis of COPD as pulmonary tuberculosis will similarly lead to a lack of appropriate treatment, resulting in a progression of the disease in the individual and further spread in the community. As such, correct diagnosis is pertinent, as misdiagnosis will lead to inappropriate treatment and suboptimal patient outcomes.<sup>(10)</sup>

### COPD vs. differential diagnosis

Differential diagnoses for COPD include asthma, obesity-related respiratory disease, ischaemic heart disease, congestive heart failure, bronchiectasis and tuberculosis. Table I shows the suggestive features of the aforementioned conditions, which will help in differentiating these diagnoses based on clinical presentations.<sup>(3)</sup>

### Management of mild COPD

Non-pharmacological therapies are important in controlling patient symptoms. Smoking cessation involves the use of pharmacotherapy such as nicotine replacement. Brief smoking

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**Table I. Differential diagnoses for chronic obstructive pulmonary disease (COPD) and their respective suggestive features.<sup>(9)</sup>**

Diagnosis	Suggestive features
COPD	<ul style="list-style-type: none"> <li>• Mid-life onset</li> <li>• Slowly progressing symptoms</li> <li>• Long history of smoking</li> </ul>
Asthma	<ul style="list-style-type: none"> <li>• Early onset</li> <li>• Varying symptoms</li> <li>• Symptoms occurring during the night/early morning</li> <li>• Presence of allergy, rhinitis and/or eczema</li> <li>• Family history</li> <li>• Airflow limitation that is largely reversible</li> </ul>
Congestive heart failure	<ul style="list-style-type: none"> <li>• Fine, basilar crackles on auscultation</li> <li>• Dilated heart on chest radiography</li> <li>• Pulmonary oedema</li> <li>• Volume restriction, rather than airflow limitation, on pulmonary function tests</li> </ul>
Bronchiectasis	<ul style="list-style-type: none"> <li>• Large volume of purulent sputum</li> <li>• Commonly associated with bacterial infection</li> <li>• Coarse crackles/clubbing on auscultation</li> <li>• Bronchial dilation and bronchial wall thickening on chest radiography/computed tomography</li> </ul>
Tuberculosis	<ul style="list-style-type: none"> <li>• Onset at all ages</li> <li>• Lung infiltrate on chest radiography</li> <li>• Microbiological confirmation</li> <li>• High local prevalence of tuberculosis</li> </ul>
Obesity-related respiratory disease	<ul style="list-style-type: none"> <li>• Obese</li> <li>• Snoring at night with brief periods of apnoea</li> <li>• Interrupted sleep</li> <li>• Daytime somnolence</li> </ul>

cessation counselling sessions (3 minutes) have been shown to be effective, with cessation rates of 5%–10% reported.<sup>(1,11)</sup> The “5As” – Ask, Advise, Assess, Assist and Arrange – can be employed to help patients who are willing to quit. Counselling by physicians is also found to significantly increase quit rates as compared to self-initiated strategies.<sup>(1,12)</sup> The Singapore Health Promotion Board QuitLine offers advice and useful information on how to quit smoking.

Annual influenza vaccination has been reported to significantly reduce COPD exacerbations.<sup>(1,13)</sup> Nichol et al found that pneumococcal vaccination for elderly patients with chronic lung disease reduces mortality and hospitalisations for pneumonia, and has direct medical care cost savings.<sup>(14)</sup> Patients with COPD can also benefit from rehabilitation and physical activity maintenance, as they improve exercise capacity, minimise hospitalisation and mortality rates, and improve recovery after exacerbation and quality of life.<sup>(1,15)</sup> Pulmonary rehabilitation is currently organised in local hospitals. Preliminary evidence shows that yoga training may improve lung function and exercise capacity on a short-term basis.<sup>(16,17)</sup> However, further studies are needed to substantiate these positive effects of yoga in COPD patients.

Mild COPD can also be managed by pharmacotherapy. Bronchodilator therapy is central to symptom management in patients with COPD and should be maximised before inhaled steroids are considered. An aerochamber can be

**Table II. Reasons and purposes for specialist referral in patients with COPD.<sup>(19)</sup>**

Reason	Purpose
Diagnostic uncertainty and exclusion of asthma	<ul style="list-style-type: none"> <li>• Establish diagnosis and optimise treatment</li> <li>• Check the degree of reversibility of airflow obstruction</li> </ul>
Unusual symptoms such as haemoptysis	<ul style="list-style-type: none"> <li>• Investigate the cause(s) of symptoms and exclude malignancy and/or tuberculosis</li> </ul>
Rapid decline in FEV1	<ul style="list-style-type: none"> <li>• Optimise management</li> </ul>
Moderate or severe COPD, or COPD with frequent exacerbations despite optimal titration	<ul style="list-style-type: none"> <li>• Optimise management</li> </ul>
Onset of <i>cor pulmonale</i>	<ul style="list-style-type: none"> <li>• Confirm diagnosis and optimise treatment</li> </ul>
Assessment of home oxygen therapy: ambulatory or long-term oxygen therapy	<ul style="list-style-type: none"> <li>• Optimise management, measure blood gases and prescribe oxygen therapy</li> </ul>
Assessing the need for pulmonary rehabilitation	<ul style="list-style-type: none"> <li>• Optimise treatment and refer to specialist or community-based rehabilitation service</li> </ul>
Bullous lung disease	<ul style="list-style-type: none"> <li>• Confirm diagnosis and refer to medical or surgical units for bullectomy</li> </ul>
Development of COPD at age < 40 yr	<ul style="list-style-type: none"> <li>• Establish diagnosis and exclude alpha1-antitrypsin deficiency</li> </ul>
Assessment for lung transplantation or lung volume reduction surgery	<ul style="list-style-type: none"> <li>• Identify criteria for referral to transplant centres</li> </ul>
Frequent chest infections	<ul style="list-style-type: none"> <li>• Rule out coexisting bronchiectasis</li> </ul>
Dysfunctional breathing	<ul style="list-style-type: none"> <li>• Establish diagnosis and refer for pharmacological and non-pharmacological management</li> </ul>

COPD: chronic obstructive pulmonary disease; FEV1: forced expiratory volume in 1 second

used in cases where patient inhaler technique is incompetent. Bronchodilators can be prescribed *pro re nata* or on regular basis to reduce symptoms. Examples of bronchodilators include beta2-adrenoceptor agonist (short- or long-acting beta2-adrenoceptor agonists [SABA or LABA]), antimuscarinic agent and methylxanthines. Combination therapy (SABA + antimuscarinic agent) produces more sustained effects with fewer side effects compared to increasing doses of single bronchodilators. Long-term treatment with inhaled corticosteroids (ICS) is only recommended in patients with severe COPD and frequent exacerbations that cannot be controlled using LABA. Combination therapy (LABA + ICS) is more effective than the respective individual drugs. Oral mucolytic agents may reduce the risk of COPD exacerbation in patients receiving little or no treatment.<sup>(18)</sup>

It is important to monitor the disease progression and development of complications such as pneumonia, pneumothorax, bronchiectasis and right heart failure, as well as screen for and manage any comorbidities associated with COPD, such as common cardiovascular and metabolic diseases, anxiety/depression and osteoporosis. The attending physician should be

alert and have a high index of suspicion for the development of lung cancer in the natural progression of COPD. Short courses of antibiotics in the treatment of moderate, infective exacerbation of COPD may be considered when there is heightened breathlessness with increased sputum volume and purulence.

### COMMON PITFALLS IN DIAGNOSING COPD

Referral to a specialist is recommended when there is progression of the disease or uncertainty regarding the diagnosis. Table II lists the various scenarios for which patients with COPD should be referred to a specialist.<sup>(19)</sup>

### TAKE HOME MESSAGES

1. COPD is a common clinical condition and a major cause of morbidity.
2. COPD should be detected in its early stages, as early diagnosis and treatment can reduce disease progression and the burden of symptoms.
3. It is important to make a correct diagnosis, as misdiagnosis causes a delay in treatment and suboptimal patient outcomes.

*You took a thorough clinical history for Mr Ng and noted that he had no family or personal history of atopy. The patient, however, remembered an episode of hospital admission for wheezing when he was very young. You referred him for spirometry, which excluded reversibility of airflow obstruction. At the six-month follow-up, you confirmed his diagnosis of COPD. You gave the patient pneumococcal and influenza vaccinations, stopped his inhaled steroid treatment and started him on regular community yoga classes. The patient subsequently felt more energetic with less dependence on inhalers, and you planned to continue working on his smoking cessation.*

**ABSTRACT** Chronic obstructive pulmonary disease (COPD) is a condition commonly encountered by primary care practitioners. The disease should be detected in its early stages to prevent disease progression and to reduce the burden of symptoms. Early treatment also results in improved mortality and reduced morbidity. COPD should be differentiated from other similar conditions such as asthma, as the basis of treatment differs in these conditions, and misdiagnosis can lead to poorer patient outcomes. Non-pharmacological treatment such as smoking cessation and vaccinations are important in the management of COPD, while pharmacotherapy such as bronchodilators and antimuscarinics are the mainstay of therapy in COPD. Referral to a specialist is recommended when there is progression of the disease or uncertainty regarding the diagnosis.

Keywords: chronic obstructive pulmonary disease, COPD, primary care

4. Attending physicians should be aware of the importance of non-pharmacological therapies when managing patients with COPD.
5. Inhaled corticosteroid is not the mainstay of treatment for COPD.

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## SINGAPORE MEDICAL COUNCIL CATEGORY 3B CME PROGRAMME

(Code SMJ 201504A)

	True	False
1. Chronic obstructive pulmonary disease (COPD) is characterised by airflow limitation that is usually progressive, and is associated with an enhanced chronic inflammatory response to noxious particles or gases in the airways and lungs.	<input type="checkbox"/>	<input type="checkbox"/>
2. COPD is not among the top five leading causes of death in the world, or the top ten causes of hospitalisation and death in Singapore in 2011.	<input type="checkbox"/>	<input type="checkbox"/>
3. Early diagnosis and appropriate treatment can help patients to improve symptoms, reduce the rate and severity of exacerbations, improve quality of life and exercise capacity, and prolong survival.	<input type="checkbox"/>	<input type="checkbox"/>
4. Patients with early COPD may walk slower than their peers, or face difficulties performing activities that could easily be done previously, and such problems can lead to changes in lifestyle and deconditioning.	<input type="checkbox"/>	<input type="checkbox"/>
5. Other differential diagnoses should be considered if a patient classified as having COPD consistently experience progressive dyspnoea, which typically worsens with exercise; chronic cough, which may or may not be productive; and have risk factors such as passive or active smoking.	<input type="checkbox"/>	<input type="checkbox"/>
6. The typical clinical symptoms of progression of COPD do not include weight loss, anorexia, depression and coronary heart disease.	<input type="checkbox"/>	<input type="checkbox"/>
7. Physical examination that reveals a prolonged expiratory phase and hyperinflation is consistent with airway obstruction.	<input type="checkbox"/>	<input type="checkbox"/>
8. In patients with COPD, spirometry typically shows obstruction ( $FEV1/FVC < 0.7$ ) and insignificant bronchodilator response.	<input type="checkbox"/>	<input type="checkbox"/>
9. A study found that the diagnosis of COPD can be incorrectly classified in up to a fifth of patients in primary care.	<input type="checkbox"/>	<input type="checkbox"/>
10. There is no practical implication in accurately classifying patients as having asthma or COPD, as their treatment algorithms (both steroids and beta-agonists inhalers) and lifestyle management are the same.	<input type="checkbox"/>	<input type="checkbox"/>
11. In persistent asthma, inhaled steroids are the basis of treatment, while bronchodilators are the mainstay of treatment in COPD.	<input type="checkbox"/>	<input type="checkbox"/>
12. Only patients with severe COPD may benefit from inhaled steroids.	<input type="checkbox"/>	<input type="checkbox"/>
13. The routine use of inhaled steroid therapy in the treatment of COPD may increase the risk of pneumonia in such patients.	<input type="checkbox"/>	<input type="checkbox"/>
14. Misdiagnosis of COPD as pulmonary tuberculosis will lead to further progression of the disease in the individual and spread of COPD in the community.	<input type="checkbox"/>	<input type="checkbox"/>
15. Differentials for COPD include asthma, obesity-related respiratory disease, ischaemic heart disease, congestive heart failure, bronchiectasis and tuberculosis.	<input type="checkbox"/>	<input type="checkbox"/>
16. Brief smoking cessation counselling by the physician is effective, but delivers a modest 1%–3% cessation rates.	<input type="checkbox"/>	<input type="checkbox"/>
17. A single dose of influenza and pneumococcal vaccine each is the current recommendation for treatment of patients aged > 65 years with COPD.	<input type="checkbox"/>	<input type="checkbox"/>
18. Pulmonary rehabilitation or incorporation of regular physical activity is important, as it helps to reduce hospital admissions and mortality in patients with COPD.	<input type="checkbox"/>	<input type="checkbox"/>
19. Early detection and management of COPD progression and complications such as pneumonia, pneumothorax, bronchiectasis and right heart failure is important.	<input type="checkbox"/>	<input type="checkbox"/>
20. Short courses of antibiotics in moderate, infective exacerbations of COPD may be considered when there is heightened breathlessness with increased sputum volume and purulence.	<input type="checkbox"/>	<input type="checkbox"/>

### Doctor's particulars:

Name in full : \_\_\_\_\_  
 MCR number : \_\_\_\_\_ Specialty: \_\_\_\_\_  
 Email address : \_\_\_\_\_

### SUBMISSION INSTRUCTIONS:

(1) Log on at the SMJ website: <http://www.sma.org.sg/publications/smjcurrentissue.aspx> and select the appropriate set of questions. (2) Provide your name, email address and MCR number. (3) Select your answers and click "Submit".

### RESULTS:

(1) Answers will be published in the SMJ June 2015 issue. (2) The MCR numbers of successful candidates will be posted online at the SMJ website by 5 June 2015. (3) Passing mark is 60%. No mark will be deducted for incorrect answers. (4) The SMJ editorial office will submit the list of successful candidates to the Singapore Medical Council. (5) One CME point is awarded for successful candidates.

**Deadline for submission: (April 2015 SMJ 3B CME programme): 12 noon, 29 May 2015.**