

Common conditions that mimic asthma

Asthma is one of the most common chronic diseases in Australia, affecting 11% of the population.¹ Most patients with asthma are managed in primary care, but globally, 20–70% of patients with asthma are undiagnosed, and 30–35% of people with an asthma diagnosis do not have evidence of current asthma.² Improved access to spirometry in primary care is often proposed as the solution. However, simple spirometry is often uninformative, and some patients need several investigations to confirm the diagnosis of asthma, or to distinguish it from common mimics.^{3,4} This article highlights conditions that commonly mimic asthma in adults and adolescents, with practical advice about key clinical features that can help direct initial investigations in primary care.

Diagnosis of asthma in adults and adolescents

Wherever possible, confirm the diagnosis of asthma before starting preventer treatment, as inhaled corticosteroids reduce the characteristic variability of asthma,⁵ and persistent airflow limitation may develop over time.⁶

A detailed history of the nature and timing of symptoms is essential to direct further investigations (Box).⁴ Physical examination, although often completely normal in asthma, may indicate alternative diagnoses. Confirmation of variable expiratory airflow limitation is needed.⁴ For patients with a high or moderate probability of asthma, obtain good quality spirometry, usually starting with bronchodilator responsiveness (spirometry before and 15 minutes after inhalation of bronchodilator, usually 4 puffs of salbutamol).^{4,7} However, its sensitivity is low; in a community population, including patients already on asthma preventer treatment, only 21% of patients ultimately confirmed as having asthma had significant bronchodilator responsiveness at initial testing.³

Spirometric testing should therefore be carried out when it is most likely to yield a diagnosis, for example, when the patient is symptomatic, and after withholding reliever medications. Careful tapering or cessation of inhaled corticosteroids may be needed.^{3,4} If the history is suggestive but the diagnosis is not confirmed by initial bronchodilator responsiveness testing, the patient should be referred for further testing and specialist advice.^{4,8}

The conditions below are common mimics of asthma, and are often misdiagnosed as asthma, but each can also coexist with asthma.

Inducible laryngeal obstruction

Patients presenting with a chronic dry irritative cough and/or episodic shortness of breath, wheezing and/or cough may have inducible laryngeal obstruction (ILO), an umbrella term for common conditions previously called vocal cord dysfunction.⁹ This may be secondary to repeated coughing during a respiratory

infection (presenting as post-viral cough), post-nasal drip and throat clearing (now called chronic upper airway cough syndrome), over-use of the voice (eg, by teachers), or laryngopharyngeal reflux, but often the cause is unknown. Patients with ILO often have increased laryngeal sensitivity to strong smells, irritants or dry air, and symptoms can be triggered by rapid breathing, for example, during intense exercise by elite athletes. Symptoms of ILO can be severe, with some patients having repeated admissions to the emergency department or intensive care unit for presumed acute severe asthma.

Key clinical clues

Patients with ILO commonly cough in response to strong smells such as perfumes or cleaning products. They may experience changed voice quality, localised tightness to the throat, or worse symptoms when talking on the phone. Inspiratory stridor is uncommon, but when it occurs it is a classic sign of ILO or structural laryngeal/tracheal problems. Symptoms of ILO are maximal during peak exercise, but if shortness of breath gets worse after the patient stops, this is pathognomonic of asthma.

Specific investigations

For patients with the above features, first provide vocal hygiene strategies,¹⁰ as these may resolve symptoms without further intervention. If symptoms persist, request spirometry with forced inspiratory flow volume loops, with the patient inhaling as fast and strongly as possible after breathing out fully. If the inspiratory loops are flattened and/or the symptoms are consistent with ILO, refer the patient to a speech pathologist or voice clinic (eg, at a major public hospital). The diagnosis of ILO is confirmed by functional laryngoscopy,¹¹ or in some centres, by specialised computerised scanning.¹² ILO often responds well to speech pathology interventions.¹³

Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is mostly found in older (≥ 40 years) smokers or ex-smokers, or with exposure to environmental tobacco smoke or other toxins. COPD is heterogeneous, with some patients having predominant emphysema, and others having airway wall thickening or destruction. Many patients with COPD are underdiagnosed.¹⁴ The diagnosis requires respiratory symptoms such as cough and shortness of breath, a history of exposure to toxic gases or particles (particularly cigarette smoke), and persistent airflow limitation (ie, post-bronchodilator spirometry shows an obstructive pattern [forced expiratory volume in 1 second divided by forced vital capacity less than the lower limit of normal]).¹⁵ Patients may have features of both asthma and COPD, sometimes called asthma–COPD overlap. Such patients have greater morbidity than those with either asthma or COPD alone,¹⁶ and are more

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Clinical features of asthma and common asthma mimics⁴

If the patient has these features	... think of asthma
<ul style="list-style-type: none"> ■ More than one type of respiratory symptom (isolated cough alone is rarely due to asthma) ■ Recurrent or seasonal respiratory symptoms ■ Symptoms worse at night or early morning ■ Symptoms triggered by exercise, allergens, cold air, laughing, viral infections, or by aspirin or β-blockers ■ Symptoms rapidly relieved by a bronchodilator inhaler ■ History or family history of allergies (eg, allergic rhinitis; although some asthma is non-allergic) ■ Symptoms beginning in childhood (although asthma can commence in adult life) ■ Symptoms during exercise that worsen after the patient stops (almost pathognomonic of asthma) 	<p>These clinical features increase the probability of asthma, but common asthma mimics (below) should also be considered. For diagnosis of asthma, objective confirmation of variable expiratory airflow limitation is still needed (see main text)</p>
If the patient has these features	... consider these asthma mimics
<ul style="list-style-type: none"> ■ Dry cough or difficulty breathing triggered by strong smells, irritants, reflux, exercise ■ Symptoms worse when talking on the phone ■ Associated throat tightness or change in voice ■ Inspiratory stridor ■ Breathlessness worse at peak exercise 	<p>Laryngeal hypersensitivity, inducible laryngeal obstruction</p>
<ul style="list-style-type: none"> ■ Onset of shortness of breath, cough, wheeze after 40 years of age ■ Smoker or ex-smoker, or exposed to environmental tobacco smoke or dust/fumes ■ History of repeated chest infections ■ Persistent shortness of breath, which may be getting worse over time ■ Family history of emphysema 	<p>Chronic obstructive pulmonary disease (think α-1 antitrypsin deficiency if onset under 35 years of age)</p>
<ul style="list-style-type: none"> ■ History of ischaemic heart disease, hypertension or valvular disease ■ Dyspnoea on lying flat ■ Basal crepitations, ankle oedema, atrial fibrillation 	<p>Cardiac failure</p>
<ul style="list-style-type: none"> ■ Dizziness, light-headedness, tingling fingers ■ Symptoms triggered by anxiety ■ Sighing (air hunger) 	<p>Panic attacks, hyperventilation</p>
<ul style="list-style-type: none"> ■ Sneezing, itching nose, eyes or ears ■ Blocked nose ■ Throat-clearing 	<p>Allergic rhinitis, chronic upper airway cough syndrome (previously called post-nasal drip)</p>
<ul style="list-style-type: none"> ■ Productive cough most days ■ Recurrent chest infections 	<p>Bronchiectasis, cystic fibrosis</p>
<ul style="list-style-type: none"> ■ Dyspnoea unresponsive to bronchodilators 	<p>Central airway obstruction</p>

likely to die or be hospitalised if treated with long-acting bronchodilators alone,¹⁷ so they should always receive inhaled corticosteroids as well as long-acting bronchodilators.^{4,18}

Key clinical clues

Although patients with COPD may have some days that are better than others, their breathing (unlike many patients with asthma) is never completely right, and usually becomes progressively worse over time. Bronchodilators typically provide only limited relief. Ask about exposures at home or work, and quantify the number of pack years, not limited to cigarettes (<https://www.smokingpackyears.com/>); most people with COPD have a smoking history of > 20 pack years. Many patients subsequently found to have COPD have had a history of annual chest infections for several years, each treated as an isolated acute event, before the pattern is recognised as representing a long term chronic condition.¹⁹ Assess for COPD in all smokers and ex-smokers with ischaemic heart disease, as tobacco exposure is a risk factor for both. Ask about family history of COPD, emphysema and liver disease,

as α -1 antitrypsin deficiency (about 1% of COPD patients) can lead to early onset emphysema despite little smoking history.²⁰

Specific investigations

Spirometry is essential for the diagnosis of COPD, but as above, this does not exclude asthma. Likewise, the presence of some bronchodilator reversibility does not rule out COPD, but the greater the bronchodilator reversibility, the more likely that the patient has asthma, instead of or as well as COPD. If COPD is suspected, respiratory function tests should include diffusing capacity, which is usually abnormal in patients with emphysema. A chest x-ray may show hyperinflation but this is also seen in severe or uncontrolled asthma. Computerised scanning of the chest should be requested if there are symptoms suggestive of bronchiectasis (eg, persistent sputum production and frequent chest infections) or lung cancer (eg, haemoptysis, chest pain, weight loss, or persistent cough despite treatment). Further details are available from the Lung Foundation Australia COPD-X concise guide.¹⁵

Cardiac failure

Cardiac failure is a common cause of persistent dyspnoea in older patients, and should be considered in those with a history of hypertension, valvular disease or ischaemic heart disease.

Key clinical clues

Ask about dyspnoea when lying flat, and nocturnal symptoms (although these are also seen with asthma or reflux). Ask about history of angina or myocardial infarction. Listen to the chest for basal crepitations or murmurs, and examine the legs for pitting oedema.

Specific investigations

These include electrocardiography and echocardiography, and B-type natriuretic peptide testing. A chest x-ray may show increased upper lobe markings and/or pleural effusion. Further details are available in Australian heart failure guidelines.²¹

Hyperventilation or panic attacks

Breathlessness that occurs at rest or on minor exertion, and that is accompanied by anxiety, may be due to hyperventilation or panic attacks. Breathlessness on exertion is normal: in a large nationally representative survey, 60.2% of Australian adults reported breathlessness only on strenuous exercise, and a further 30.2% were short of breath when hurrying on the level or walking up a slight hill. Greater breathlessness than this is classified as clinically important; it was reported by 9.5% of adults, and was much more common in patients with depression or anxiety.²²

Key clinical clues

Breathlessness is very alarming, so do not assume a patient is having panic attacks if they report feeling anxious; ask whether they were feeling anxious or stressed *before* they started feeling short of breath. Hyperventilation can cause symptoms such as dizziness or tingling in fingers, and patients with hyperventilation or dysfunctional breathing often feel the need to sigh (air hunger).

Specific investigations

There is no gold standard for diagnosis of panic attacks and hyperventilation, but a respiratory physiotherapist can assess a patient's breathing pattern, and can train the patient in relaxation and diaphragmatic breathing. Tools such as the 10-item Kessler Psychological Distress Scale²³ are available for screening for anxiety and depression in clinical practice.

Clinical vignettes

Some clinical vignettes are provided in the [Supporting Information](#), highlighting the importance of a careful history, as well as appropriate investigations. Given the risk of severe exacerbations with even mild asthma, guidelines strongly recommend referral for expert advice if the diagnosis of asthma is uncertain

or cannot be confirmed with initial investigations.⁴ Access to good quality spirometric testing is essential, to confirm the diagnosis of asthma and exclude alternative or comorbid diagnoses, so that patients can be commenced on appropriate treatment.

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Supporting Information

Additional Supporting Information is included with the online version of this article.