

## **Q:** How should one investigate a chronic cough?

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**A:** A chronic cough (ie, a cough lasting more than 8 weeks<sup>1</sup>) has many possible causes. Physicians should use a structured diagnostic approach based on observing the clinical picture, trying therapy for the likely cause, obtaining targeted investigations, and referring to a specialist when needed (FIGURE 1).

To begin, obtain a clinical history, perform a physical examination, and order a chest radiograph.

In the history, look for exposure to environmental irritants such as tobacco smoke, allergens, or dust, or medications such as angiotensin-converting enzyme (ACE) inhibitors or oxymetazoline (Afrin). If a potential irritant is present, it should be avoided or stopped immediately.<sup>1-3</sup> If the cough improves partially or fully when exposure to the irritant is stopped, this supports a diagnosis of chronic bronchitis or, in the case of ACE inhibitors, ACE-inhibitor-induced cough. The character of the cough (eg, paroxysmal, loose, dry, or productive<sup>1</sup>) has not been shown to be diagnostically useful or specific.

If the chest radiograph is abnormal, then the diagnostic inquiry should be guided by the abnormality. Abnormalities that cause cough include bronchogenic carcinoma, sarcoidosis, and bronchiectasis. If the radiograph is normal, then upper airway cough syndrome, asthma, gastroesophageal reflux disease (GERD), chronic bronchitis, or nonasthmatic eosinophilic bronchitis is more likely.

### ■ COMMON CAUSES OF CHRONIC COUGH

The most common causes of chronic cough, accounting for 95% of cases, are chronic bronchitis due to environmental irritants, upper airway cough syndrome, GERD, asthma, nonasthmatic eosinophilic bronchitis, and bronchiectasis (TABLE 1).<sup>1-8</sup>

#### **Chronic bronchitis**

As noted above, a history of exposure to an irritant suggests this diagnosis.

#### **Upper airway cough syndrome**

Upper airway cough syndrome (formerly known as postnasal drip) is due to chronic upper respiratory tract irritation and hypersensitivity of cough receptors.<sup>3,4</sup> Sources of irritation vary and include sinusitis and any form of rhinitis: allergic and nonallergic, postinfectious, environmental irritant-induced, vasomotor, and drug-induced.

Patients complain of postnasal drip or frequent clearing of the throat. On physical examination one can see mucus in the oropharynx or a cobblestone appearance. However, these symptoms and signs are not specific and may be absent.

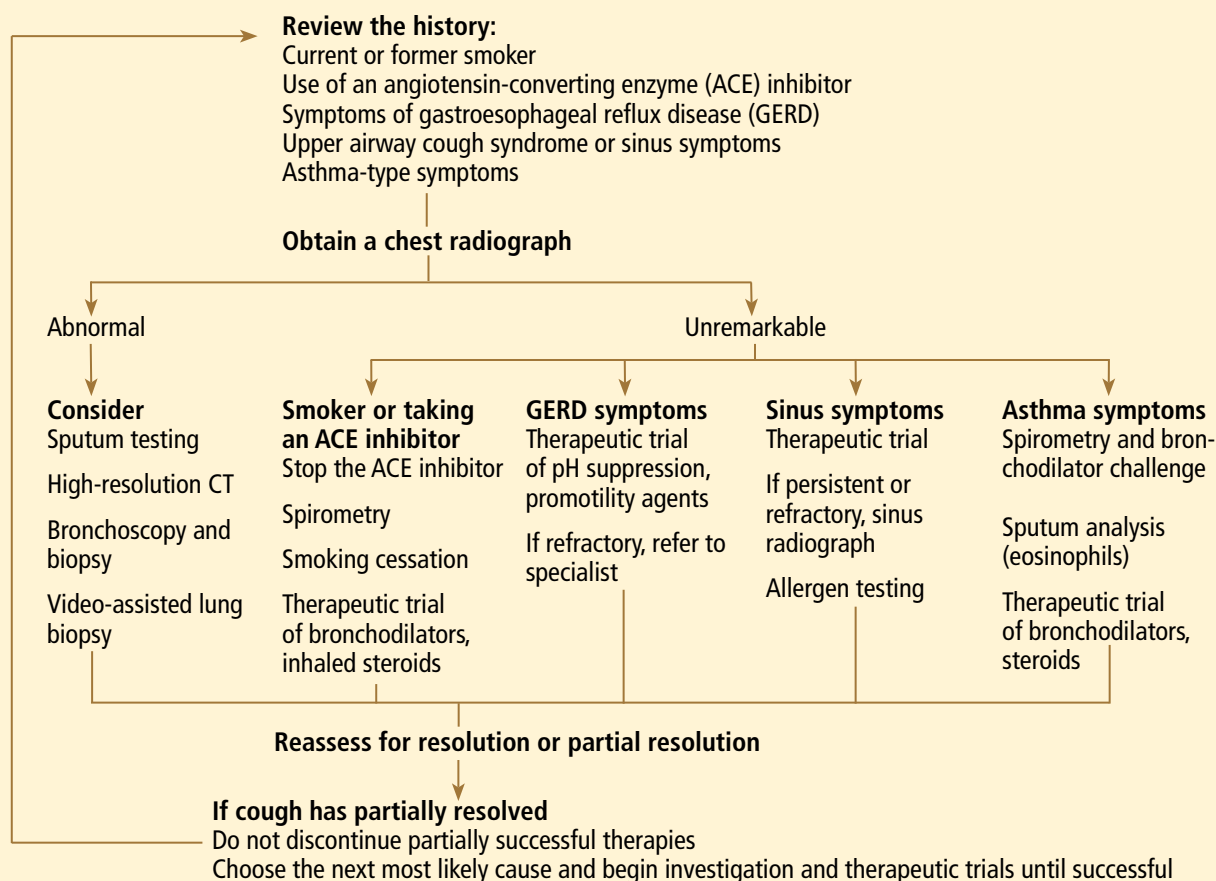
A therapeutic trial is warranted, but be aware that different rhinitides respond to specific treatments:

- Histamine-mediated or allergic rhinitis will respond to allergen avoidance, new-generation antihistamines such as loratadine (Claritin), mast cell stabilizers such as cromolyn (Intal), and intranasal glucocorticoids such as fluticasone (Flovent).<sup>4,5</sup>
- Nonhistamine-mediated rhinitides (the common cold and perennial nonallergic rhinitis) respond to older-generation antihistamines such as diphenhydramine (Benadryl)

**Look for  
a history  
of exposure  
to irritants**

doi:10.3949/ccjm.77a.10033

## How to investigate a chronic cough



**FIGURE 1**

and decongestant combinations. If these cannot be used, intranasal glucocorticoids and ipratropium (Atrovent) are alternatives.

- Vasomotor rhinitis will respond to intranasal ipratropium 0.3% for 3 weeks and then as required.
- Postinfective rhinitis, ie, a cough that began as severe bronchitis, would warrant an antihistamine-decongestant combination.

With adequate treatment, the cough should improve after 1 to 2 weeks; if rhinosinus symptoms persist, consider bacterial sinusitis and obtain radiographs of the sinuses. If imaging shows mucosal thickening ( $> 5$  mm) or an air-fluid level, treat with decongestants and antibiotics for 3 weeks.<sup>1,4,5</sup>

### Gastroesophageal reflux disease

GERD is another common cause of cough,

and the most difficult to exclude.<sup>5</sup> Look for a history of reflux or heartburn and positional coughing, and have a low threshold for beginning empiric therapy. Indeed, according to the 2006 American College of Chest Physicians Cough Guideline Committee,<sup>5,6</sup> should a patient arrive in your clinic with a chronic cough and a normal chest radiograph who does not smoke and is not on an ACE inhibitor, then you should start empiric reflux therapy. Begin with lifestyle changes, acid suppression, and prokinetics. The cough may take 1 to 2 months before it begins to improve, and even longer to resolve.

The gold standard for diagnosis is 24-hour pH and impedance monitoring with patient self-reporting of symptoms. However, this test is not available everywhere, and there is no consensus on how to interpret the results.<sup>1,5,6</sup> If

you strongly suspect the patient has GERD-related cough but it fails to improve with intense medical management, then refer to a specialist, as antireflux surgery may be required.

### Cough-variant asthma

Cough is the only symptom of asthma in cough-variant asthma, in which the usual features of dyspnea and wheezing are absent.<sup>7</sup> A methacholine challenge shows bronchial hyperresponsiveness, and asthma therapy resolves the cough.

### Nonasthmatic eosinophilic bronchitis

It is important to distinguish asthma from nonasthmatic eosinophilic bronchitis,<sup>7,8</sup> an underdiagnosed condition. Both conditions respond equally well to treatment with inhaled or oral steroids. However, patients who have nonasthmatic eosinophilic bronchitis have normal results on spirometry and the methacholine challenge test. The diagnosis of nonasthmatic eosinophilic bronchitis is made if more than 3% of the nonsquamous cells in an induced sputum sample are eosinophils.

### ■ UNCOMMON CAUSES OF COUGH

The remaining 5% of cases of cough are caused by conditions that include bronchogenic carcinoma, chronic interstitial pneumonia, sarcoidosis, left ventricular dysfunction, use of ACE inhibitors, neurosensory cough, dynamic airway collapse, aspiration due to pharyngeal dysfunction, and psychogenic causes.<sup>1</sup>

### ■ MULTIPLE CAUSES

Therapeutic trials will support the diagnosis. If more than one cause is suggested, start treatment in the order in which the abnormalities are discovered. If treatment is only partially successful, then pursue further causes and add to the existing treatment without stopping it.

Cough may have more than one cause, but in up to 98% of patients it can be successfully treated.

### ■ IMPORTANT POINTS

- Multiple causes of chronic cough can co-exist.

TABLE 1

### Causes of chronic cough

#### Common causes

Chronic bronchitis<sup>1</sup>  
Upper airway cough syndrome<sup>1-4</sup>  
Gastroesophageal reflux disease<sup>5,6</sup>  
Cough-variant asthma<sup>7,8</sup>  
Nonasthmatic eosinophilic bronchitis<sup>7,8</sup>  
Bronchiectasis

#### Uncommon causes

Angiotensin-converting enzyme inhibitor use  
Bronchogenic carcinoma  
Interstitial pulmonary disease  
Psychogenic causes

- Therapeutic trials are part of the workup.
- Do not stop therapy if it is only partially successful: add to existing therapies
- Start the investigation with the most likely cause.
- Treatment is 84% to 98% successful. ■

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**Start empiric GERD therapy if the patient has a chronic cough and a normal chest x-ray, does not smoke, and is not on an ACE inhibitor**