10 CHRONIC COUGH

General Discussion

The cough reflex is complex, but cough generally results from an irritant stimulation of one or more receptors in the respiratory system. Estimating the duration of cough is the first step in narrowing the list of possible diagnoses. Cough may be classified as acute (less than 3 weeks), subacute (3–8 weeks), or chronic (more than 8 weeks). If the cough is productive of blood, the patient should be evaluated according to guidelines for hemoptysis.

In nonsmokers who do not take an angiotensin-converting enzyme (ACE) inhibitor and whose chest x-ray is normal, the most likely causes of chronic cough are asthma, postnasal drip (also known as upper airway cough syndrome [UACS]), or gastroesophageal reflux disease (GERD). Other common causes in immunocompetent patients include chronic bronchitis due to cigarette smoking or other irritants, bronchiectasis, and eosinophilic bronchitis. The physician should assess the likelihood of the most common causes using empiric therapy trials and trials that involve the avoidance of irritants and drugs, along with focused laboratory testing, such as chest radiography or methacholine challenge.

A normal chest radiograph in an immunocompetent patient makes postnasal drip syndrome, asthma, GERD, chronic bronchitis, and eosinophilic bronchitis more likely and makes bronchogenic carcinoma, tuberculosis, bronchiectasis, and sarcoidosis unlikely. If the chest radiograph is abnormal, the patient should be evaluated on the basis of the diseases suggested by the radiographic findings.

Postnasal drip syndrome is the most common cause of chronic cough; no diagnostic test exists, so the patient should be evaluated for this condition first. Suggestive findings on the history and physical include drainage in the posterior pharynx, throat clearing, nasal discharge, cobble stoning of the oropharyngeal mucosa, and mucus in the oropharynx. A trial of therapy with a decongestant and first-generation histamine H_1 receptor antagonist is reasonable.

Cough-variant asthma may also be considered as a cause of chronic cough. Spirometry can demonstrate airflow obstruction and reversibility of the condition. If asthma is suspected, but physical examination and spirometry are nondiagnostic, a methacholine challenge should be considered because its negative predictive value is 100%.

For GERD, an empiric trial of a proton pump inhibitor is recommended. The cough should nearly or completely resolve with treatment if it is due to GERD. If GERD is suspected but a therapeutic trial is ineffective, 24-hour monitoring of the esophagus may be considered, although it is inconvenient for patients and is not widely available.

Although most long-term smokers have a cough, it should not be assumed that the cough is due to the smoking, unless they stop smoking and the cough resolves. It is also important to recognize that multiple conditions often simultaneously contribute to cough. Chronic cough has two or more causes in 18% to 62% of patients and three causes in up to 42% of patients. The definitive diagnosis of the cause of chronic cough is established on the basis of an observation of which specific therapy eliminates the cough. Therapy that is partially successful should not be stopped but should instead be sequentially supplemented.

If the patient has a history of smoking, is exposed to environmental irritants, or is currently being treated with an ACE inhibitor, the patient should be instructed to eliminate the irritant or discontinue the medication for 4 weeks. If the cough improves or resolves, the cough is partially or entirely due to chronic bronchitis or to the ACE inhibitor.

Eosinophilic bronchitis can be distinguished from asthma by the lack of bronchial hyper-responsiveness or variable airflow obstruction. Patients with nonasthmatic eosinophilic bronchitis have normal spirometry and respond to inhaled and systemic corticosteroids. Eosinophilic bronchitis can be ruled out as a cause of chronic cough if eosinophils make up less than 3% of the nonsquamous cells in a sample of induced sputum.

Tuberculosis (TB) should be considered early in the evaluation of patients with chronic cough when the likelihood of tuberculosis is high. This includes places where the prevalence of TB is high and in populations at high risk of TB (e.g., HIV-infected persons). TB should also be considered in patients with chronic cough who have sputum production, hemoptysis, fever, or weight loss.

Causes of Chronic Cough

Aberrant innominate artery
ACE inhibitor use
Arteriovenous malformation
Aspiration
Asthma
Bronchiectasis
Bronchiolitis
Bronchogenic carcinoma
Chronic aspiration
Chronic bronchitis due to smoking or other irritants
Cystic fibrosis
Environmental exposure
Eosinophilic bronchitis
Foreign body aspiration
GERD
Immune deficiencies
Interstitial lung disease

Irritable larynx
Irritants
Irritation of external auditory meatus
Left ventricular failure
Lower respiratory tract infection
Lymphoma
Metastatic carcinoma
Persistent pneumonia
Pertussis infection
Postinfectious cough
Postnasal drip (also known as UACS, which includes chronic sinusitis, allergic rhinitis, vasomotor rhinitis, and nonallergic rhinitis)
Psychogenic cough
Pulmonary abscess
Sarcoidosis
Tracheitis
Upper respiratory tract infection
TB

Key Historical Features

- ✓ Fever
- ✓ Symptoms of asthma
- ✓ Heartburn or regurgitation
- ✓ Symptoms of postnasal drip (throat clearing, nasal discharge, excessive phlegm production)
- ✓ Exacerbating factors
- ✓ Diurnal variation
- ✓ Hemoptysis
- ✓ Purulent sputum
- ✓ Night sweats
- ✓ Weight loss
- ✓ Medical history
- ✓ Medications, especially ACE inhibitors
- ✓ Tobacco use
- ✓ Environmental exposures
- ✓ HIV risk factors

Key Physical Findings

- ✓ Vital signs
- ✓ Head and neck examination for lymphadenopathy, nasal discharge, sinus tenderness, a cobblestone appearance of the oropharynx, mucus in the oropharynx
- ✓ Cardiac examination for evidence of left ventricular failure

✓ Pulmonary examination for any abnormal breath sounds
✓ Extremity examination for cyanosis or clubbing

Suggested Work-Up

Chest x-ray	Optional in the initial evaluation of younger nonsmokers with suspected postnasal drip syndrome or sinusitis

Additional Work-Up

Pulmonary function testing	To evaluate for asthma
Methacholine challenge	If spirometry is nondiagnostic, methacholine challenge may be useful in ruling out asthma because it has a negative predictive value of 100% in the context of cough.
Bronchoscopy	Should be considered when the cause of cough remains unclear after an initial evaluation
Evaluation of induced sputum	May be helpful in diagnosing nonasthmatic eosinophilic bronchitis
High-resolution computed tomography of the chest	Helpful in evaluating chest radiograph abnormalities
24-h esophageal pH monitoring	May help link GERD and cough. Has a low specificity, so starting treatment for GERD usually is preferable to testing as an initial decision
Barium esophagography	May reveal reflux in cases when refluxate from the stomach has a pH value similar to that of the normal esophagus, thus preventing its detection during esophageal pH monitoring
Computed tomography of the sinuses	If chronic sinusitis is suspected
Cardiac studies	If a cardiac cause of the cough is suspected

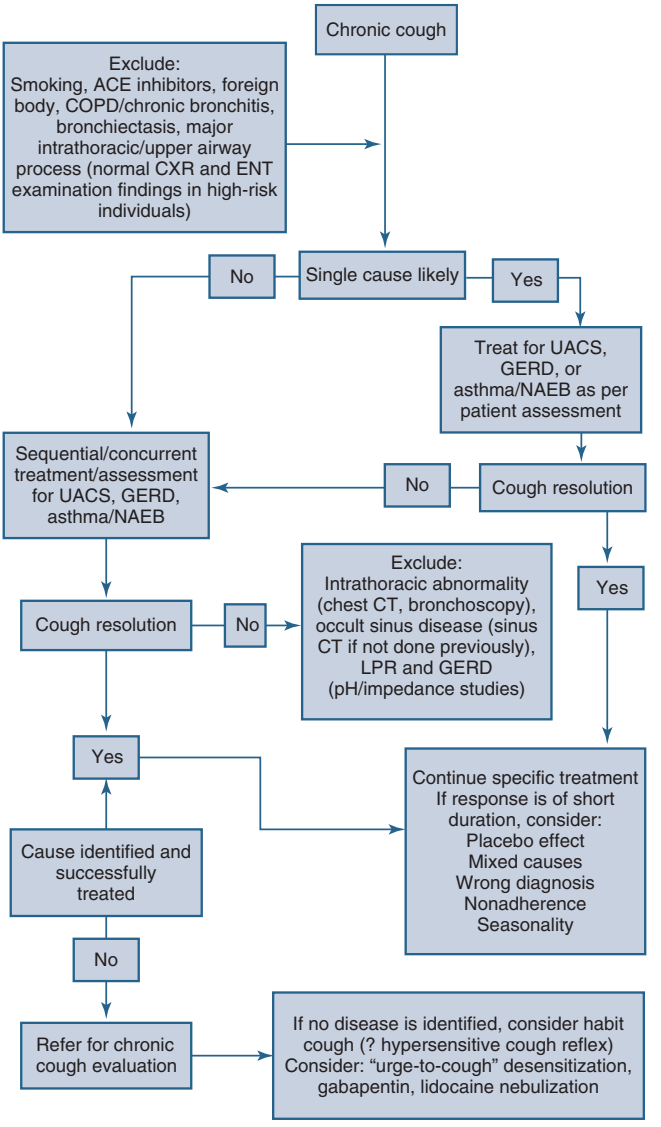

Figure 10-1. *ACE*, Angiotensin-converting enzyme; *COPD*, chronic obstructive pulmonary disease; *CT*, computed tomography; *CXR, chest x-ray; ENT, ear, nose, and throat*; *GERD*, gastroesophageal reflux disease; *LPR, laryngopharyngeal reflux; NAEB, non-asthmatic eosinophilic bronchitis*; *UACS*, upper airway cough syndrome. From Iyer VN, Lim KG. Evaluation of chronic cough in the immunocompetent host. Mayo Clinic Proceedings 2013;88:1115–1125.

Further Reading

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