

Cough: Controversies and Consensus 2011

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Brian's Case

Brian, a 25 year old male, has had a cough for the last four months. He is a non-smoker and is on no medications. He has been previously healthy. The cough started with a "cold" (fever, malaise, productive cough for seven days). All symptoms resolved except for cough, which is nonproductive. The cough is exacerbated by cold and dust, and he wakes coughing three to four times per week. His physical examination is normal. After one week of antihistamine there was no change. After one week of β_2 -agonist and inhaled corticosteroid, there was a reduction in frequency and intensity of cough, but it still persisted (mainly at night). There was near complete resolution after adding a proton pump inhibitor. Spirometry confirmed the diagnosis of asthma with a 20% increase in FEV1 following bronchodilator.

Discussion: A step-wise approach to diagnosis and treatment often yields near complete resolution. More than one cause for cough may be found.

Cough is a common presentation of a variety of infectious and noninfectious illnesses (Table 1, modified from Chung and Pavord¹). Cough is categorized as acute (less than three weeks duration), subacute (three to eight weeks

duration), and chronic (greater than eight weeks duration). Generally, acute cough is infectious in etiology (e.g., rhinovirus), while subacute cough is postinfectious. Chronic cough is typically noninfectious, but a chest x-ray should be ordered to exclude uncommon infectious etiologies. Of special mention, adult pertussis can present with an acute (catarrhal phase, one to two weeks), a subacute (paroxysmal phase, two to three months), or a chronic (convalescent phase, greater than three months or "100 day cough").² The cough of pertussis typically consists of multiple coughs during a single expiration and post-tussive emesis or cough syncope may occur.

Acute Cough

The British National Institute for Health and Clinical Excellence (NICE) has published an approach for adults with acute cough.³ They recommend advising patients on the usual course of their illness, including the average duration (see Table 2). They further recommend either a "no antibiotic" approach or a

Table 1

Differential Diagnosis of Acute and Chronic Cough

- 1. Acute Infections:**
 - Upper Airway: Tracheobronchitis, acute bronchitis
 - Lower Airway: Pneumonia
- 2. Chronic Infections:**
 - Bronchiectasis
 - Cystic Fibrosis
 - Tuberculosis
- 3. Inflammatory conditions**
 - Asthma*
 - Eosinophilic bronchitis*
- 4. Upper Airway Cough Syndrome**
 - Postnasal drip (rhinosinusitis)*
 - Obstructive sleep apnea
 - Chronic tonsillar hypertrophy
- 5. Tumours**
 - Airway: Bronchogenic carcinoma, bronchial adenoma
 - Parenchymal: Alveolar cell carcinoma
 - Extrapulmonary: Mediastinal
- 6. Drugs**
 - Angiotensin converting enzyme inhibitors (ACE inhibitors)
- 7. Cardiac**
 - Congestive heart failure
 - Pulmonary infarction
- 8. Other**
 - Gastroesophageal Reflux Disease (GERD)*
 - Chronic bronchitis*
 - Recurrent aspiration
 - Interstitial lung disease
- 9. Rare**

Note: diseases with an asterix (*) will be discussed in detail within the body of the text

Table 2

Typical Durations of Illnesses Associated with Acute Cough

- A. 1 Week**
 - Acute sore throat
 - Acute pharyngitis
 - Acute tonsillitis
- B. 1 ½ Weeks**
 - Common cold
- C. 2 ½ Weeks**
 - Acute rhinosinusitis
- D. 3 Weeks**
 - Acute bronchitis

“delayed antibiotic” approach for treatment. In either case, patients are advised that they should be reassessed with disease worsening or with extension beyond the expected duration and that antibiotic treatment may then be offered. They also describe high risk patients who should be offered immediate antibiotic treatment (Table 3).

Chronic Cough

A step-wise approach to the diagnosis of cough can achieve favourable results in the majority of patients.⁴ Before proceeding to laboratory evaluation with a chest x-ray and spirometry, the medical history is critical. If the patient is taking an ACE inhibitor, a trial of drug elimination or substitution should be considered. If the cough persists after discontinuing the ACE inhibitor, the step-wise approach can be started. Similarly, in the setting of chronic cigarette consumption, chronic bronchitis is the most likely diagnosis.

Table 3

Immediate Antibiotic Treatment for Patient Presenting with Acute Cough

A. Significant Medical Co-morbidity

- Concurrent heart, lung, renal, liver, neuromuscular disease, immunosuppression, or cystic fibrosis

B. Increased Age

- 80 plus years of age
- Those 65 to 79 years and one or more of the following criteria:
 - Admission to hospital in the previous year
 - Diabetes
 - History CHF
 - Current oral glucocorticoids

C. Systemically Unwell

- Symptoms and signs suggesting serious illness and/or complications, including:
 - Pneumonia
 - Mastoiditis
 - Peritonsillar abscess
 - Intraorbital and intracranial complications

However, it is important to determine if the patient is describing a changing cough. In that setting, bronchogenic carcinoma should be excluded.

Step 1

Evaluate for Upper Airways Cough Syndrome (UACS).⁵ This includes conditions such as post nasal drip (PND), obstructive sleep apnea, and chronic tonsillar enlargement. Start with a first generation anti-histamine/decongestant to treat presumed PND. If the cough is resolved after one week, the diagnosis is confirmed. If the cough is still present, but improved, add a nasal corticosteroid spray.

Step 2

Consider cough variant asthma and treat with an inhaled β_2 agonist and an inhaled corticosteroid for one week. If after one week there is no improvement, prescribe oral prednisone 30 mg for one week. This will treat cough variant asthma, post-viral airway hyper-reactivity, and eosinophilic bronchitis.⁶ Pre- and post-bronchodilator spirometry is typically ordered to confirm the diagnosis of asthma. If spirometry is equivocal, more detailed bronchoprovocation (methacholine or exercise) testing should be considered.

Step 3

Review the chest imaging and treat/investigate any abnormal findings.

Step 4

Consider gastroesophageal reflux disease as a cause of cough.⁷ Initiate antireflux therapy, including pharmacologic (proton pump inhibitor) and nonpharmacologic (elevate head of bed; avoid food two hours before bed; avoid food triggers) treatment. If there is no response or an incomplete response, consider adding a promotility agent to treat nonacid reflux.

Step 5

Consider uncommon causes and investigate for bronchiectasis or interstitial lung disease (CT scan), tracheal tumour (bronchoscopy), or heart failure (echocardiogram).

Unexplained Cough

Up to 40% of individuals may complete this step-wise approach and still suffer from chronic cough.⁵ These patients typically

Frequently Asked Questions

1. Is a clinical trial of bronchodilators and inhaled steroids sufficient to make a diagnosis of asthma?

Asthma is defined by pulmonary function testing. It is a lifelong diagnosis and as such should be confirmed


2. Is referral to a specialty clinic needed?

If there is no significant improvement after completing step-wise evaluation, referral may offer specialized testing (e.g., bronchoscopy or induced sputum testing)

demonstrate increased sensitivity to cough-inducing agents and often have increased numbers of airway neutrophils or lymphocytes. Treatment is currently limited to antitussives, trigger avoidance, and possibly the use of gabapentin. Unexplained cough is different from psychogenic cough, which is rare but is also a diagnosis of exclusion. Psychogenic cough does not have specific clinical characteristics, and neither the presence of a honking or barking cough, nor the absence of nocturnal cough, helps to further characterize the cough.

A step-wise approach to the diagnosis of a cough can achieve favourable results in the majority of patients.

Controversies and Gaps in Knowledge of Chronic Cough¹

1. There are few randomized controlled trials showing these interventions to be of help
2. Often the interventions subjectively improve cough, but they rarely eliminate it
3. There may be difficulty in assigning cough to a specific cause but rather conclude that it is multi-factorial
4. There may be failure to recognize typical clinical and pathological patterns of disease in patients with cough thought to be due to different causes
5. Non-eosinophilic chronic cough largely arises in middle-age women, irrespective of the potential cause 

References

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