

Overview of the Management of Cough

CHEST Guideline and Expert Panel Report

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This overview will demonstrate that cough is a common and potentially expensive health-care problem. Improvement in the quality of care of those with cough has been the focus of study for a variety of disciplines in medicine. The purpose of the Cough Guideline and Expert Panel is to synthesize current knowledge in a form that will aid clinical decision-making for the diagnosis and management of cough across disciplines and also identify gaps in knowledge and treatment options. CHEST 2014; 146(4):885-889

ABBREVIATIONS: CHEST = American College of Chest Physicians

Editor's Note: This is the first of a series of articles that is part of the CHEST Organization's update of its 2006 Evidence-Based Clinical Practice Guidelines on the Diagnosis and Management of Cough. You may have already seen it online ahead of print. The subject matter that will comprise this new Cough Guideline and Expert Panel Report is tabulated in this article. While this article and selected others will appear in print as well as online, look for the entire spectrum of topics that will be progressively updated online during the course of the coming months to several years.

In neurophysiologic and acoustical terms, cough arises following activation of a complex sensorimotor reflex arc whose sound can be easily identified by the human ear. The distinctive sound is generated by the explosive release of trapped and pressurized intrathoracic air from the sudden opening of the vocal folds.¹ Because cough is an easily described and recognizable physical act, patients know what is being referred to as cough, thereby lending

credibility to findings from patient surveys on prevalence of cough. This has also enabled investigators to develop cough-specific, patient-reported outcome tools by which physicians can assess the impact of cough on patients. Moreover, because the sound resulting from coughing has a typical acoustic waveform profile, software detection algorithms for automatic monitoring² have been developed for cough counting.

While cough in healthy individuals is physiologically important, it typically is of little clinical importance because it is normally a very uncommon event.^{3,4} Nevertheless, it assumes great importance as (1) a defense mechanism when it helps clear excessive secretions and foreign material from the airways, (2) a factor in the spread of infection, (3) a patient-initiated tactic to provide

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replace professional medical care and physician advice, which always should be sought for any medical condition. The complete disclaimer for this guideline can be accessed at <http://dx.doi.org/10.1378/chest.1464S1>.

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cardiopulmonary resuscitation to maintain consciousness during a potentially lethal arrhythmia and/or convert arrhythmias to a normal rhythm,^{5,6} and (4) a common symptom for which patients seek medical attention. While we acknowledge that cough can be viewed from a variety of perspectives, the focus of this update of the 2006 guidelines⁷ will be on managing cough as a symptom and when its defense mechanism function has been impaired. Moreover, while the majority of topics in this update will be written to aid practicing clinicians in a variety of disciplines, as well as patients, other topics such as those that appear in Table 1 also target basic and clinical researchers as the intended users.

The Importance of Cough

Recognition by the American College of Chest Physicians (CHEST) of the importance of cough in clinical practice in the United States was the impetus for developing the first evidence-based cough guideline, published in 1998.⁸ Since then, and the publication of the second edition in 2006,⁷ the impact of cough on global health has attained widespread recognition. Published cough guidelines, albeit of varying quality and foci (eg, adults, pediatrics, acute cough, chronic cough, cough in palliative care), have been developed by organizations not only from the United States⁷ but also from Australia,⁹ Belgium,¹⁰ Brazil,¹¹ China,¹² Germany,¹³ United Kingdom,¹⁴ Ireland,¹⁵ Netherlands,¹⁶ Japan,¹⁷ South Africa,¹⁸ and Spain.¹⁹ Prevalence data from Australia, Great Britain, Japan, and the United States provide the putative reason for the widespread interest in developing cough guidelines. Government-generated statistics from Australia²⁰ and the United States²¹ reveal that cough of undifferentiated duration is the single most common complaint for which patients of all ages seek medical care from primary care physicians in the ambulatory setting. Surveys in Japan²² and Great Britain²³ suggest that the prevalence of chronic cough in the general population is 10.2% and 12%, respectively. Further, financial data derived from the over-the-counter market for cough and cold remedy products that are of doubtful benefit and potentially harmful for young children⁷ support the statistics that cough is a very troublesome symptom. According to a survey conducted for the CHEST Expert Cough Panel in US dollars by The Nielsen Company,²⁴ consumers spent (1) approximately \$6.8 billion in the United States for the 52-week period that ended on March 16, 2013; (2) approximately \$88 million in Australia for the 52-week period that ended December 16, 2012; (3) approximately \$101 million in Canada for the 52-week period that ended on March 9,

2013; and (4) approximately \$156 million in Great Britain for the 52-week period that ended March 30, 2013. While these countrywide figures are large, especially in the United States, they greatly underestimate the total cost of treating cough. They do not reflect the total economic burden of direct costs that include the physician fees, radiographs, and laboratory testing, and the cost of prescription drugs for the myriad causes of cough other than the common cold and indirect costs, such as time missed from work.

In its deliberations regarding how to update the second edition of these guidelines and advance the field, the Expert Panel unanimously decided to cover the same comprehensive spectrum of topics (Table 1), albeit in a different order, to keep the publication up to date and clinically useful, while doing so according to the more rigorous, evidence-based methodologies²⁵ that have evolved since the last publication.⁷ While the panelists believed that all clinically important topics would be covered in this update, they not only acknowledged that the final titles of topics listed in Table 1 might be modified but also knew that they would be able to add additional ones should the need arise, because the update would be an evolving process developed over time. To satisfy all of these objectives, even when the evidence on some topics was not robust enough for guideline recommendations, the Expert Panel sought and received approval from the CHEST organization's Guidelines Oversight Committee for creating a hybrid model for providing advice regarding the diagnosis and management of cough. This current publication is a product of this hybrid model; it provides a combination of recommendations derived from clinical practice guideline methodology and suggestions derived from consensus statement methodology (one component of which is a modified Delphi process for consensus achievement).²⁶ The specifics of how this was accomplished are described in the methodology article in this report.²⁶ Moreover, to keep this publication and all guidelines as current as possible, the CHEST organization has developed and implemented its "living guidelines" model,^{25,27} whereby topics are reviewed for possible updating on an annual basis, and when new evidence or interventions demand it, they are updated. To avoid delays in publishing, these updates will be added to the literature as soon as updates are finalized, and the full scope of topics, in their entirety, will appear over a 4-year period.

In addition to these advances, the current set of topics focuses on the concept of intervention fidelity,²⁸ because

TABLE 1] Spectrum of Topics for the Third Edition of the CHEST Cough Guidelines

Section	Topics
Introductory matter	Overview of the management of cough
	Methodologies for the development of the management of cough: CHEST guideline and expert panel report
	Anatomy and neurophysiology of coughing
	Global physiology and pathophysiology of cough
	An assessment of intervention fidelity in studies on the diagnosis and treatment of chronic cough in the adult
	Tools for assessing outcomes in studies of chronic cough: CHEST guideline and expert panel report
	Classifying cough as an aid to suggesting differential diagnoses ^a
	Empirical management of cough
Acute cough	Common cold
	Acute bronchitis
	Allergic rhinitis
	Community-acquired pneumonia
Subacute	Postinfectious
	Pertussis
Chronic	Upper airway cough syndrome
	Asthma
	Nonasthmatic eosinophilic bronchitis
	Gastroesophageal reflux disease
	Chronic bronchitis/COPD
	Bronchiectasis
	Bronchiolitis and other nonbronchiectatic suppurative airway disease
	Occupational and environmental factors
	Drug-induced cough
	TB
	Interstitial lung disease
	Lung cancer
	Aspiration
	Cardiac causes
	Psychogenic, habit, and tic cough
Uncommon causes	
Unexplained (refractory) chronic cough	
Special groups	Pediatric age group
	Immunocompromised host
	Athletes
	The elderly
Symptomatic	Cough suppressant
	Pharmacologic protussive therapy

^aWhile cough due to many conditions such as asthma and aspiration will be discussed in the chronic category, these conditions can present acutely and subacutely. Nevertheless, the same principles of management apply once the diagnosis is made.

the lack of attention to it may help explain some of the varying successes in treating chronic cough that have been reported in the literature. Intervention fidelity is the “extent to which an intervention was delivered as

conceived and planned to arrive at valid conclusions concerning its effectiveness in achieving target outcomes.”²⁹ Because of the importance of this concept, the Expert Panel suggests that it be included in the design of

studies of cough and how it might be addressed to prospectively avoid and assess the problem (R. S. I. and C. T. F., unpublished data, 2014).

As cough is a global problem managed by a variety of disciplines, these guidelines and the Expert Panel Report represent the interprofessional, collaborative efforts of an international group of 53 individuals from the fields of adult and pediatric pulmonology and respiratory, internal medicine and family medicine, allergy, psychology, neurology, adult and pediatric speech pathology, otolaryngology, gastroenterology, gerontology, infectious disease, nursing, anatomy, physiology, thoracic oncology, palliative care, and pharmacy. Methodologists and representatives for lay consumers and the US Food and Drug Administration also served on the Panel and provided invaluable insights.

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