
CME review

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Habit cough

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Objective: To review habit cough and its treatments to raise awareness of this condition as a potential cause of chronic cough.

Data Sources: Relevant articles and references published between January 1, 1962, and April 30, 2008, were found through a PubMed search using the following keywords: *habit cough*, *psychogenic cough*, *chronic cough*, and *tic cough*.

Study Selection: All key relevant articles were reviewed, and the most relevant were selected for inclusion in this review.

Results: Habit cough is a diagnosis of exclusion and can occur in children and adults with chronic cough. Characteristic features of habit cough include a loud honking or barking cough, disruption of normal activities, and the frequent presence of a secondary gain (such as school absence). Successful treatment has been described in several case reports and involves mostly nonpharmacologic measures.

Conclusions: It is important to consider habit cough in the differential diagnosis of chronic cough because early diagnosis can help to avoid unnecessary invasive procedures and potential iatrogenic complications.

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Off-label disclosure: Drs Ramanuja and Kelkar have indicated that this article does not include the discussion of unapproved/investigative use of a commercial product/device.

Financial disclosure: Dr Kelkar has indicated that in the last 12 months he has served on the Speakers' Bureau for Teva, Astra Zeneca, Merck, UCB, and Aventis and worked as a consultant for Greer and CoCo Pharma. Dr Ramanuja has indicated that in the last 12 months he has received honoraria from Astra Zeneca for clinical preceptorships, as well as an honorarium from the American Lung Association-Upper Midwest for speaking at the Asthma Specialist Outreach Program.

Instructions for CME credit

1. Read the CME review article in this issue carefully and complete the activity by answering the self-assessment examination questions on the form on page 96.
2. To receive CME credit, complete the entire form and submit it to the ACAAI office within 1 year after receipt of this issue of the *Annals*.

INTRODUCTION

Cough is among the most common complaints of patients seeking a physician's care. One study¹ reported that cough is the most common complaint of adults seen in an ambulatory care setting. Even with a clear diagnosis, cough can be difficult to control and, for the patient, can be associated with impaired quality of life.² Three phases have been described in the cough reflex: (1) an inspiratory phase, (2) a forced expiratory effort against a closed glottis, and (3) opening of the glottis, with subsequent rapid expiration, that generates a characteristic cough sound.³ Cough can originate from 3 anatomical sources: central nervous system, major airways, and pulmonary parenchyma.⁴ Adult cough can be divided into acute self-limiting cough (lasting less than 3 weeks), subacute cough (lasting 3 to 8 weeks), and chronic cough (lasting longer than 8 weeks). Pediatric cough is classified into acute

(lasting less than 2 weeks), subacute (lasting 2 to 4 weeks), and chronic (more than 4 weeks).

An anatomical diagnostic protocol has been used in the diagnostic workup of chronic cough, and using this stepwise approach, it was found that the most common causes for chronic cough were cough-variant asthma, gastroesophageal reflux disease (GERD), and rhinosinusitis associated with postnasal drip syndrome (also known as upper airway cough syndrome).⁵ However, the anatomical diagnostic protocol, which has mainly been used in adults, is not necessarily valid for children.⁶ Other causes of chronic cough include pertussis, cystic fibrosis, angiotensin-converting enzyme inhibitor-induced cough, vocal cord dysfunction, and nonasthmatic eosinophilic bronchitis.^{7,8} Up to 46% of patients seen in secondary care settings with chronic cough have an unexplained cough, despite extensive investigation and treatment trials.⁹

Habit cough has been described in the literature as another cause of chronic cough and has been denoted by various terms, such as *psychogenic cough*, *cough tic*, *honking cough*, and *barking cough*.¹⁰ Habit cough can be challenging to diagnose and treat in everyday clinical practice. Allergists,

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being specialists in upper and lower airway disorders, are commonly consulted for persistent cough. The objective of this article is to review habit cough, including the clinical presentation, diagnosis, and treatment, to raise awareness of this condition as a potential cause of chronic cough. Relevant articles and references published between January 1, 1962, and April 30, 2008, were found through a PubMed search using the following keywords: *habit cough*, *psychogenic cough*, *chronic cough*, and *tic cough*. All key relevant articles were reviewed, and the most relevant were selected for inclusion in this review.

CLINICAL PRESENTATION AND DIAGNOSIS

The classic presentation of habit cough is that of a harsh, barking, repetitive cough that occurs several times per minute for hours on end.⁸ The diagnosis of habit cough has primarily been reported in pediatric and adolescent populations, but uncommonly in adults.¹⁰ More than 90% of cases of habit cough have been reported in patients younger than 18 years.¹¹ Onset of habit cough has been reported to occur as early as 2 years of age.¹² Studies by Holinger and colleagues^{13,14} have found habit cough to be the second most common cause of chronic cough in children aged 6 to 16 years. It has been reported that adults with habit cough have a greater duration of symptoms than children and adolescents.¹⁵ Two cases have been reported in the geriatric population.¹⁶ No sex predilection has been documented for habit cough in children,¹⁷ although a preponderance of females has been reported among patients with idiopathic chronic cough (typically perimenopausal or postmenopausal age, reporting a preceding upper respiratory tract infection, and having a heightened cough reflex to tussive stimuli).^{2,18}

Habit cough often follows a cough associated with a respiratory tract infection and can last for a month to years.⁴ It has been postulated that the initial illness creates a learned, subconscious model (ie, habit) for the cough.¹⁶ The cough often disrupts normal activities, such as school attendance,¹² and tends to increase when parents or teachers are present.⁶ The cough has been likened to the call of the Canadian wild goose, and thus the cough has been described as a “honking” cough. The cough has also been described as loud and explosive. The characteristic posture of patients with habit cough is the “chin-on-chest” posture, which is keeping the chin on the chest and holding the hand against the throat as if to support the larynx.¹⁹ There is no expectoration, no subsequent breathlessness or fatigue, and no change in the voice.²⁰ Clinical findings and laboratory and imaging study results frequently are negative.¹⁹ The patient claims to be unable to repeat the cough when requested to do so,²⁰ although it has been reported that patients can produce the cough on command.²¹ In addition, patients with habit cough typically do not respond to medications, such as antibiotics, inhaled corticosteroids, antihistamines or decongestants, and cough suppressants.^{16,19}

It has been suggested that patients with habit cough typically do not cough at night and have a cough with a loud

barking or honking character that can be heard even before the patient is seen.^{10,19,20,22} The cough is extremely irritating to those in the presence of the person who has this disorder, even though patients frequently do not exhibit any concern over this (known as “la belle indifference”).⁸ However, the barking or honking character is not specific for habit cough because a variety of diseases may also present with barking or honking cough (such as bronchiectasis, GERD, and postnasal drip syndrome).²³ The disappearance of the cough with sleep is not necessarily specific for habit cough because cough from other causes (such as chronic bronchitis) has been reported to be absent once patients fall asleep.^{24,25} One case report using a cough monitor suggests that some patients with habit cough can even have increased cough at night.¹¹ Thus, the presence or absence of nighttime cough or cough with a barking or honking character should not be used to diagnose or exclude habit cough.^{10,23}

The coexistence of a psychiatric disorder has been reported in patients with habit cough; such disorders include conversion disorder and mixed anxiety and depressive disorder.²⁰ Habit cough may represent a somatic manifestation of a wide range of psychosocial problems, including school phobia, family problems, and attention seeking, and the underlying cause may relate to the secondary gain produced by the coughing, such as school absence.^{6,19,26} Organic causes of cough have been reported to coexist in patients with habit cough. Notable examples include vocal cord dysfunction²⁷ and asthma²⁸; the latter was a case report that involved a cough accompanied by eye-squinting movements (a physical finding not previously described). Unlike cough from most underlying organic causes, habit cough typically diminishes in frequency with vigorous physical exertion or pleasurable social activities.¹⁶

Habit cough has been reported to result in various complications, such as rib fractures.²⁹ In addition, paroxysmal, violent coughing may result in other complications, such as vomiting, incontinence, syncope, bradycardia, laryngitis, rupture of subconjunctival, nasal, and anal veins, pneumothorax, pneumomediastinum, and diaphragmatic rupture.^{17,30} Table 1 summarizes the features of habit cough in the pediatric and adolescent population, and Table 2 lists proposed diagnostic criteria for habit cough in adults.

In patients with chronic cough, the diagnosis of habit cough is a diagnosis of exclusion that can be made only after an extensive evaluation has been performed to rule out other disorders.¹⁰ This extensive investigation is important to assure both the physician and the patient that no major disease is being missed; however, it is important not to keep performing futile investigations that may reinforce the underlying problem, and early diagnosis is essential to avoid iatrogenic complications from invasive procedures, hospitalizations, and medications.⁶ In adult patients with chronic cough that remains persistently troublesome despite an extensive and thorough evidence-based evaluation, and after behavior modification and/or psychiatric therapy has failed, unexplained cough should be diagnosed rather than habit cough or

Table 1. Clinical Characteristics of Habit Cough in the Pediatric and Adolescent Population¹⁶

- Negative, extensive workup for organic cause of the cough
- Cough disrupts normal activities
- Classic “barking” or “honking” quality to the cough
- Cough typically does not awaken patient from sleep
- Cough decreases in frequency or severity with pleasurable social activities or exercise
- Cough frequently preceded by upper respiratory tract infection
- Secondary gain is acquired from the cough (eg, parental attention, missing school)
- Patient exhibits “la belle indifférence” to the cough
- Coughing becomes worse in the presence of parents, teachers, or health care professionals
- Patients report a “tickle” in the throat and may adopt a “chin-on-chest” posture
- No sex predilection
- Underlying psychopathology rarely present
- Usually responds well to behavioral modification techniques

Table 2. Proposed Diagnostic Criteria for Habit Cough in Adults¹⁶

- Cough is chronic (>3-week duration)
- Cough not explained by an organic cause after a thorough diagnostic evaluation
- Cough not responsive to combined therapy for postnasal drip syndrome, asthma, or gastroesophageal reflux disease
- Cough is not intentionally produced or feigned (malingering or factitious disorders)
- At least 3 or more of the following clinical characteristics are present:
 - Female sex
 - Single or widowed
 - Cough does not awaken patient from sleep
 - Underlying psychopathologic condition is present (ie, depression, anxiety, or somatoform disorder)
 - Cough disrupts normal social activities and worsens with social contacts (eg, family, health care professionals, telephone conversations)
 - Secondary gain is associated with the cough
 - Cough precipitated by emotional distress
 - “La belle indifférence” is displayed despite severity of the cough

psychogenic cough; in children with chronic cough, the diagnosis of habit cough can be made only after tic disorders and Tourette syndrome have been evaluated and cough improves with specific therapy such as behavior modification or psychiatric therapy.¹⁰

TREATMENT

A variety of treatment modalities have been described for habit cough, most of which involve nonpharmacologic measures. Behavior modification therapies have been reported as a potential approach not only for habit cough but also for chronic cough refractory to medical treatment.³¹ Lokshin et al³² identified 9 patients with habit cough (5 of whom had been hospitalized for the cough) and used suggestion therapy for all patients. The suggestion therapy consisted of a single

15-minute session that used a distracter (administration of dilute nebulized lidocaine). The session involved the following elements: (1) the therapist expressing confidence that the patient could be taught how to stop the cough, (2) explaining the cough as a vicious cycle of an initial irritant that had set up a pattern of coughing, (3) encouraging the suppression of cough to break the cycle, (4) repeatedly expressing confidence that the patient was developing the ability to resist the urge to cough, (5) asking the patient if he/she is beginning to feel that he/she can resist the urge to cough, and (6) after the patient has gone 5 minutes without coughing, stopping the session when the patient affirms that they can resist the urge to cough. Slow breathing of the aerosol distracter was performed during the session. All of the patients became symptom free during the 15-minute session. During the subsequent week, 1 remained completely asymptomatic and 8 had transient minor relapses that were readily self-controlled. Of the 9 patients, 7 were contacted for determination of long-term outcome at periods of up to 9 years after the session. Six were totally asymptomatic, and 1 had occasional minor self-controlled symptoms. The authors concluded that patients with habit cough are best served by using suggestion therapy and avoiding pharmacotherapy. The art of suggestion was also used by Berman³³ in 6 children with habit cough; all of the children were told the exact nature of their condition, that it was a habit and was unnecessary and therefore must stop. All 6 children improved and were free of cough during a long-term period of observation.

Cohlan and Stone²¹ used a unique form of reinforcement suggestion therapy involving a bed sheet. This involved convincing the patient that the persistent cough has weakened the chest muscles and, because the chest muscles are unable to contain the cough, that a bed sheet tightly wrapped around the chest would provide the necessary support to stop the cough within 24 to 48 hours. If the patient felt the urge to cough, instructions were given to breath in and out of the mouth. The patient was instructed to wear the bed sheet at all times unless he or she was sure there would be no cough once the sheet was removed. This was successful in 31 of 33 patients.

Lavigne et al³⁴ described a different approach not involving aversive procedures; the child and parent were told that the symptoms may have had their origin in a disease process, but the symptoms continued even after the disease process had resolved. They were told that the habit could be broken if they would practice gradually reducing the occurrence of the symptom during short periods. Parents recorded the cough frequency at home during a defined period each day, and the child was aware of the recording. A series of goals were set for the child, and rewards were given for decreasing the rate of coughing. Parents also were encouraged to have the child return to normal activities as soon as possible. The authors described 4 patients with habit cough in whom this treatment approach was successful. McGarvey et al¹¹ reported success with a series of sessions in behavior modification (including relaxation techniques and speech therapy) in a 13-year-old

boy with habit cough. One small study²⁷ reported breathing exercises that were beneficial.

Distracters have been used in the treatment of habit cough. Nebulized lidocaine therapy has been reported to be successful.^{32,35} Matrovich and Greenberger¹⁶ described a 66-year-old woman whose cough responded to a distracter in the form of a throat lozenge. Lollipops have also been used as distracters in patients with habit cough,²⁹ as have sips of warm water.³² Bernstein³⁶ described another technique involving a distracter in a patient with habit cough who was a mouth breather. A flat button was placed between the patient's lips, compelling her to breathe through her nose; the patient was told that she would not cough as long as she kept the button between her lips (ie, as long as she breathed through her nose). For the first 3 days the patient had occasional cough while the button was out, but after that she had resolution of the cough without use of the button and continued to breathe through her nose.

Anbar and Hall¹² instructed 51 patients with habit cough in self-hypnosis for relaxation and to help ignore the cough-triggering sensation. Among these 51 patients, the cough resolved during or immediately after the initial hypnosis instruction session in 78%, within 1 week in an additional 8%, and within 1 month in an additional 4%. It is thought that the effectiveness of self-hypnosis in the treatment of habit cough is due to increased relaxation and alteration in the perception of the cough trigger. The authors concluded that self-hypnosis is a safe and effective means of resolving habit cough; in addition, by not relying on medications, making negative statements about the patient's muscle strength, or requiring reinforcement by family members, self-hypnosis promotes patient autonomy and self-reliance.

Voice therapy (using relaxation and breathing techniques) combined with psychotherapy have also been used with success in patients with habit cough.²⁷ In some cases, pharmacologic therapy has been used in the treatment of habit cough. Weinberg¹⁹ described a 10-year-old boy with habit cough who was given a mild tranquilizer in addition to reassurance and help with his school problem (enlisting the aid of his parents and teachers).

CONCLUSION

Habit cough can be a debilitating disorder that can impair a patient's quality of life. It can occur in pediatric and adult patients, and even though patients may not be concerned about their symptoms, the symptoms are bothersome to others, such as family members, health care professionals, and educational staff. Habit cough is a diagnosis of exclusion; although it typically does not respond to pharmacotherapy, behavioral therapy techniques have been described with success. It is important to consider habit cough in the differential diagnosis of chronic cough, especially in patients who do not respond to typical management for other more common causes of cough (such as asthma, GERD, and postnasal drip). Correctly diagnosing and treating habit cough can help avoid unnecessary interventions and iatrogenic complications (such as adverse effects from corticosteroids).

REFERENCES

1. Smyrniotis NA, Irwin RS, Curley FJ, French CL. From a prospective study of chronic cough: diagnostic and therapeutic aspects in older adults. *Arch Intern Med.* 1998;158:1222-1228.
2. Morice AH, McGarvey L, Pavord I. Recommendations for the management of cough in adults. *Thorax* 2006;61(suppl 1):i1-24.
3. Chung KF, Pavord ID. Prevalence, pathogenesis, and causes of chronic cough. *Lancet.* 2008;371:1364-1374.
4. O'Connell EJ, Rojas AR, Sachs MI. Cough-type asthma: a review. *Ann Allergy* 1991;66:278-285.
5. Irwin RS, Corrao WM, Pratter MR. Chronic persistent cough in the adult: the spectrum and frequency of causes and successful outcome of specific therapy. *Am Rev Respir Dis.* 1981;123:413-417.
6. Shields MD, Bush A, Everard ML, McKenzie S, Primhak R. BTS guidelines: recommendations for the assessment and management of cough in children. *Thorax* 2008;63(suppl 3):iii1-iii15.
7. Rank MA, Kelkar P, Oppenheimer JJ. Taming chronic cough. *Ann Allergy Asthma Immunol.* 2007;98:305-313.
8. Weinberger M, Abu-Hasan M. Pseudo-asthma: when cough, wheezing, and dyspnea are not asthma. *Pediatrics.* 2007;120:855-864.
9. Pavord ID, Chung KF. Management of chronic cough. *Lancet.* 2008; 371:1375-1384.
10. Irwin RS, Glomb WB, Chang AB. Habit cough, tic cough, and psychogenic cough in adult and pediatric populations: ACCP evidence-based clinical practice guidelines. *Chest* 2006;129:174S-179S.
11. McGarvey LP, Warke TJ, McNiff C, Heaney LG, MacMahon J. Psychogenic cough in a schoolboy: evaluation using an ambulatory cough recorder. *Pediatr Pulmonol.* 2003;36:73-75.
12. Anbar RD, Hall HR. Childhood habit cough treated with self-hypnosis. *J Pediatr.* 2004;144:213-217.
13. Holinger LD. Chronic cough in infants and children. *Laryngoscope.* 1986;96:316-322.
14. Holinger LD, Sanders AD. Chronic cough in infants and children: an update. *Laryngoscope.* 1991;101:596-605.
15. Gay M, Blager F, Bartsch K, Emery CF, Rosenstiel-Gross AK, Spears J. Psychogenic habit cough: review and case reports. *J Clin Psychiatry.* 1987;48:483-486.
16. Mastrovich JD, Greenberger PA. Psychogenic cough in adults: a report of two cases and review of the literature. *Allergy Asthma Proc.* 2002; 23:27-33.
17. Butani L, O'Connell EJ. Functional respiratory disorders. *Ann Allergy Asthma Immunol.* 1997;79:91-99.
18. McGarvey LP. Idiopathic chronic cough: a real disease or a failure of diagnosis? *Cough.* 2005;1:9.
19. Weinberg EG. 'Honking': psychogenic cough tic in children. *S Afr Med J.* 1980;57:198-200.
20. Bhatia MS, Chandra R, Vaid L. Psychogenic cough: a profile of 32 cases. *Int J Psychiatry Med.* 2002;32:353-360.
21. Cohlman SQ, Stone SM. The cough and the bedsheet. *Pediatrics.* 1984; 74:11-15.
22. Riegel B, Warmoth JE, Middaugh SJ, et al. Psychogenic cough treated with biofeedback and psychotherapy: a review and case report. *Am J Phys Med Rehabil.* 1995;74:155-158.
23. Mello CJ, Irwin RS, Curley FJ. Predictive values of the character, timing, and complications of chronic cough in diagnosing its cause. *Arch Intern Med.* 1996;156:997-1003.
24. Power JT, Stewart IC, Connaughton JJ, et al. Nocturnal cough in patients with chronic bronchitis and emphysema. *Am Rev Respir Dis.* 1984;130: 999-1001.
25. Irwin RS, Zawacki JK, Curley FJ, French CL, Hoffman PJ. Chronic cough as the sole presenting manifestation of gastroesophageal reflux. *Am Rev Respir Dis.* 1989;140:1294-1300.
26. Shuper A, Mukamel M, Mimouni M, Lerman M, Varsano I. Psychogenic cough. *Arch Dis Child.* 1983;58:745-747.
27. Blager FB, Gay ML, Wood RP. Voice therapy techniques adapted to treatment of habit cough: a pilot study. *J Commun Disord.* 1988;21: 393-400.
28. Linz AJ, Daniels RW, Fallon LF Jr. Psychogenic cough in an asthmatic

- child: case report with unusual findings. *J Asthma*. 2007;44:13–18.
29. Lorin MI, Slovis TL, Haller JO. Fracture of ribs in psychogenic cough. *N Y State J Med*. 1978;78:2078–2079.
30. George L, Rehman SU, Khan FA. Diaphragmatic rupture: a complication of violent cough. *Chest*. 2000;117:1200–1201.
31. Vertigan AE, Theodoros DG, Gibson PG, Winkworth AL. Review series: chronic cough: behaviour modification therapies for chronic cough. *Chronic Respir Dis*. 2007;4:89–97.
32. Lokshin B, Lindgren S, Weinberger M, Koviach J. Outcome of habit cough in children treated with a brief session of suggestion therapy. *Ann Allergy*. 1991;67:579–582.
33. Berman BA. Habit cough in adolescent children. *Ann Allergy*. 1966;24:43–46.
34. Lavigne JV, Davis AT, Fauber R. Behavioral management of psychogenic cough: alternative to the “bedsheet” and other aversive techniques. *Pediatrics*. 1991;87:532–537.
35. Sherman JM. Breaking the cycle: lidocaine therapy for habit cough. *J Fla Med Assoc*. 1997;84:308–309.
36. Bernstein L. A respiratory tic: “the barking cough of puberty”: report of a case treated successfully. *Laryngoscope*. 1963;73:315–319.

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Objectives: After reading this article, participants should be able to demonstrate an increased understanding of their knowledge of allergy/asthma/immunology clinical treatment and how this new information can be applied to their own practices.

Participants: This program is designed for physicians who are involved in providing patient care and who wish to advance their current knowledge in the field of allergy/asthma/immunology.

Credits: ACAAI designates each Annals CME Review Article for a maximum of 2 category 1 credits toward the AMA Physician’s Recognition Award. Each physician should claim only those credits that he/she actually spent in the activity. The American College of Allergy, Asthma and Immunology is accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing medical education for physicians.

CME Examination

1–5, Ramanuja S and Kelkar P. 2009;102:91–95.

CME Test Questions

1. Chronic cough in a pediatric patient is defined as lasting how long?
 - a. longer than 2 weeks
 - b. longer than 4 weeks
 - c. longer than 6 weeks
 - d. longer than 8 weeks
 - e. longer than 12 weeks
2. What are the 3 most common causes of chronic cough in adults?
 - a. pertussis, asthma, and gastroesophageal reflux disease
 - b. cystic fibrosis, postnasal drip, and asthma
 - c. eosinophilic bronchitis, angiotensin-converting enzyme inhibitor–induced cough, and postnasal drip
 - d. habit cough, vocal cord dysfunction, and asthma
 - e. asthma, gastroesophageal reflux disease, and postnasal drip
3. Which of the following is NOT a characteristic feature of habit cough?
 - a. frequently preceded by upper respiratory tract infection
 - b. worsening in the presence of parents, teachers, and health care professionals
 - c. posttussive emesis
 - d. la belle indifference
 - e. no sex predilection
4. Which of the following pharmacologic measures have been reported to have some success in treatment of patients with habit cough?
 - a. antihistamines
 - b. tranquilizers
 - c. decongestants
 - d. inhaled corticosteroids
 - e. antibiotics
5. Which of the following distracters have been used in the treatment of habit cough?
 - a. sips of warm water
 - b. nebulized lidocaine
 - c. throat lozenges
 - d. flat button between the lips
 - e. all of the above

Answers found on page 115.