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Chronic Cough

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IN BRIEF

Chronic Cough

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Cough is a reflex that protects the lungs from aspirating food or inhaling irritants. It is a key component of the nonimmune pulmonary defense system. The cough that accompanies most common respiratory infections usually resolves in 7 to 10 days and rarely is a cause of concern. The patient who has frequent viral infections may complain of a "chronic" cough, but a careful history will reveal a shorter duration of repetitive episodes with coughs resolving completely in between infections. Chronic cough usually is defined as lasting for more than 3 to 4 weeks. Chronic cough is a symptom, not a diagnosis, and the underlying cause should be ascertained.

Prolonged cough in infants always is unusual and should be investigated. Infections such as *Chlamydia* and pertussis may be the culprit. Chronic cough, often associated with persistent wheezing, may be the presenting complaint from extrinsic airway compression. Examples include endobronchial tuberculosis (compression from enlarged lymph nodes) and congenital heart disease, especially with large left to right shunts (enlarged left atrium and hypertensive, dilated pulmonary arteries). If the cough is associated with feeding, gastroesophageal reflux, vascular rings, or tracheoesophageal fistula should be considered. Aspiration syndromes should be

considered in neurologically or neuromuscularly impaired children. Passive exposure to environmental irritants, such as cigarette smoke, may lead to chronic cough or exacerbate other underlying conditions.

Although most common in toddlers, foreign body aspiration must be considered in all children who have a chronic cough. Historic clues in unwitnessed episodes include an abrupt onset of cough and feeding of inappropriate foods (peanuts, seeds).

Symptoms of malabsorption, failure to thrive, nasal polyps, rectal prolapse, and airway colonization with *Staphylococcus aureus* or *Pseudomonas aeruginosa* suggest cystic fibrosis (CF). Failure to thrive is not always present because 15% of patients who have CF are pancreatic-sufficient.

Asthma is the most common cause of chronic cough in pediatric patients. These patients may not wheeze, but the diagnosis of asthma is suggested by a history of cough that is precipitated by viral illnesses, cold air, exercise, irritants, animals, or other allergens; is worse at night; and responds to an adequate trial of bronchodilators. Sinusitis is a frequent cause of chronic cough in childhood and should be suspected in cough that is accompanied by nasal discharge, headache, or malodorous breath. Allergic rhinitis should be suspected in chronic cough that has a seasonal component or is associated with exposure to specific triggers.

Psychogenic cough occurs in childhood and adolescence. Patients have a typical barking, harsh, paroxysmal cough that is absent during sleep and that worsens when attention is drawn to it. Some patients have a peculiar "chin on chest" posture while coughing. A viral infection may precede the development of psychogenic cough, which remains due to secondary gain or school phobia.

Pertussis may cause chronic cough

from infancy through adulthood. Adolescents and adults constitute a major source of transmission. Some of these patients did not receive the complete series of vaccinations because of concerns of side effects; however, protection in those who received the complete series is incomplete (approximately 80% protected) and wanes over time. Pertussis tends to be less severe in older patients. Common complaints include a tingling sensation in the throat, dyspnea, and paroxysmal cough. Post-tussive emesis, whoop, cyanosis, and lymphocytosis are less common.

Mycoplasmal infections should be added to the list of infectious causes of chronic cough in school-age children and adolescents. Smoking should not be overlooked in this age group.

A thorough history and physical examination should help the clinician to focus the diagnostic evaluation. A history of hemoptysis, recent weight loss, unusual infections, or evidence of chronic lung disease such as hyperinflation or clubbing requires a prompt and thorough evaluation and referral. If there is no evidence of serious disease or uncommon causes of cough, the evaluation can proceed deliberately and systematically. If asthma is suspected, pulmonary function testing, pre- and postbronchodilator use, provocative challenge testing (ie, methacholine, exercise), or a trial of a bronchodilator is warranted. A trial of bronchodilators should not be considered complete unless a therapeutic dose has been administered. A sweat test and a Mantoux skin test are easily administered screening tests that should be done early in the evaluation. A chest radiograph may reveal a congenital abnormality, atelectasis or localized air trapping to suggest foreign body, hilar adenopathy, or generalized hyperinflation and peribronchial cuffing consistent with

asthma. Additional tests should be guided by clinical suspicion.

Often, careful reexamination and evaluation is warranted before costly and misguided evaluations are pursued. If the former approach is taken, the physician should explain why he or she is undertaking this approach

so that it is not misinterpreted by the family as a lack of concern. Cough suppressants in children recently have been shown to have no benefit over a placebo. Their use should be discouraged, again with careful explanation to the parents. The importance of cough as a protective reflex and the

need to treat the underlying illness, rather than the symptom, should be stressed.

Jeffrey M. Ewig, MD
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IN BRIEF

Thumbsucking

Oral Habits: A Behavioral Approach.

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Influence of Thumb Sucking on Peer Social Acceptance in First-Grade Children.

Friman PC, McPherson KM, Warzak WJ, Evans J. *Pediatrics*. 1993;91:784-786

A Thermoplastic Thumb Post for the Treatment of Thumb-Sucking. Allen K, Flegle J, Watson T. *Am J Occup Ther*. 1991;46:552-554

An Effective and Acceptable Treatment Alternative for Chronic Thumb- and Finger-Sucking. Friman P, Leibowitz J. *J Pediatr Psychol*. 1990;15:57-65

Thumbsucking is a form of non-nutritive sucking occurring as early as the 29th week of gestation; it is seen commonly in infants and peaks at 18 to 21 months of age. Developmentally normal children possess an inherent biological drive for sucking, the explanation for which can be found in both psychoanalytic and learning theory. Psychoanalytic theory contends that non-nutritive sucking represents a biological drive resulting from pleasurable stimulation of the lips and mouth; learning theory proposes that the infant learns to associate sucking with pleasurable feelings such as satiety or being held. Whatever the theoretical basis, thumbsucking generally is viewed as a biological drive that develops into a habit, which in the majority of cases resolves by age 4 years, but can persist much longer.

Sequelae of thumbsucking depend on the habit's duration, frequency, and intensity, as well as the position of the thumb in the mouth. Prolonged

thumbsucking can affect dentofacial structures, the thumb, or both; can serve as a source of infection or accidental poisoning; and can affect a child's social acceptance and self-esteem.

Johnson and Larsen summarize the potential dentofacial changes caused by prolonged thumbsucking as those affecting the maxilla and mandible, the interarch relationship, lip placement and function, and tongue placement and function. Temporomandibular joint problems, sublingual mucosal ulceration, and apical root resorption also have been reported. Some spontaneous correction of the dentofacial effects can be expected if the habit persists until 9 years of age and then is stopped, with most of the correction occurring within the first year after the habit ceases.

Orthopedic problems that have resulted from prolonged thumbsucking include the development of a radial angular deformity, with the digit malaligned as much as 40 degrees. Other commonly occurring effects to the thumb include soreness and callous formation, chronic paronychia, irritant eczema, and herpetic whitlow. Thumbsucking also has been reported to be a source of introducing infection such as *Candida* or of accidental ingestion of harmful substances in contact with the digit and then introduced into the mouth.

Psychological consequences of thumbsucking cannot be underestimated. Friman et al assessed the effect of chronic thumbsucking on social acceptance among 40 first-grade children. The children rated photographs of thumbsucking peers as less intelligent, happy, attractive, likable, and fun, and less desirable as a

friend, seatmate, or playmate.

Illingsworth states that the danger of thumbsucking is not in the habit itself but in what parents do about it. Unhappiness, resentment, and insecurity can result from constant parental nagging and reprimands.

Treatment aimed at eliminating prolonged thumbsucking should be considered when any of the previously mentioned complications affect the child's health or functioning. However, treatment generally is not considered necessary before 4 to 6 years of age. Options include physical barriers, orthodontic appliances, aversive taste treatments, and when appropriate, psychological counseling.

Physical barriers as simple as band-aids, mittens, socks, and tape or those somewhat more complex, such as the thermoplastic thumb post described by Allen et al, have met with variable degrees of success. The dental literature is replete with descriptions of devices such as a "hayrake," a palatal bar fixed to the molars that does not interfere with occlusion but serves to break the seal caused by the sucking action. Such devices, while effective, are expensive.

Aversive taste treatments applied locally to the thumb have been effective. Friman and Liebowitz performed a randomized clinical trial on 22 thumbsuckers ages 4 years and older using aversive taste coupled with a reward system and reported 12 cessations within 3 months and 20 cessations within 1 year.

Finally, it must be recognized that thumbsucking or other chronic habits may indicate underlying frustration, emotional stress, anxiety, or other phenomena that suggest the need for

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