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FROM THE FAMILY PRACTICE INQUIRIES NETWORK

What is the diagnostic approach to a 1-year-old with chronic cough?

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EVIDENCE-BASED ANSWER

Very few studies examine the evaluation of chronic cough among young children. Based on expert opinion, investigation of chronic cough should begin with a detailed history, physical examination, and chest radiograph (strength of recommendation [SOR]: **C**, expert opinion).[1]

Before pursuing additional studies, remove potential irritants from the patient's environment. Work-up for persisting cough should consider congenital anomalies and then be directed toward common causes of chronic cough like those seen in older children and adults, including postnasal drip syndrome, gastroesophageal reflux disease (GERD), and asthma (SOR: **C**).

EVIDENCE SUMMARY

The data on which expert opinion is based comes from case series of chronic cough in adults and older children in the setting of a specialty clinic.[2,3] A detailed history should attend to the neonatal course, feeding concerns, sleep issues, potential for foreign-body aspiration, medications, infectious exposures, family history of atopy or asthma, and exposures to environmental irritants such as tobacco smoke.[1] A dry, barking, or brassy cough in infants suggests large airway obstruction; in older children, it is likely psychogenic. A wet, productive cough is associated with an infectious cause. A cough associated with throat clearing suggests GERD or postnasal drip syndrome.[3]

Chest radiography, although universally recommended, was only abnormal for 4% of older patients (age 6 years through adult) from one series.[2] Chest radiography may be most helpful for infants at increased risk for foreign-body aspiration. Cough from passive smoke exposure should improve with removal of exposure. There is no information on how long to wait for improvement.[1]

If the initial evaluation is not revealing, further investigation should focus on congenital anomalies, asthma, postnasal drip, and GERD. Aberrant innominate artery and asthma were the most frequent diagnoses among children aged <18 months old referred for otolaryngology consultation.[3] Because pulmonary function testing is

not practical for infants, a trial of aggressive therapy in combination with a “cough diary” kept by the parents may be used to diagnose asthma.[1] Sinus computed tomography films are not routinely recommended to evaluate for postnasal drip, as sinusitis among children does not correlate well with postnasal drip.[1] GERD may present with chronic cough; however, there is insufficient evidence for a uniform approach to diagnosis of cough associated with reflux.[4]

After evaluating infants for common causes of chronic cough (or if suggested by the history or physical), less common causes should be explored (**Table**). Consider a sweat chloride test first, followed by tuberculin testing. More than one cause for chronic cough was found 23% of the time in adults.[2] Multiple causes of cough may be less common among infants, though no data confirm this.

Though it includes a mixture of adults and older children, a case series from pulmonary specialists finds pulmonary function tests with methacholine challenge the most helpful test.[2] Case series from otolaryngology find endoscopy to be the most helpful, but it also includes a mix of older patients.[3] Therefore, it seems likely that primary care physicians already appropriately refer patients to the correct specialists for evaluation. The optimal time to refer patients is unknown. We identified no reports from primary care settings. The question is an appropriate topic for primary care research.

Causes of chronic cough among children with normal chest radiograph

Category	Diagnoses
Asthma	Cough-variant asthma, hyperactive airways after infection
Infectious	Chronic sinusitis, otitis media with effusion, chronic bronchitis, bronchiectasis, chronic Waldeyer’s ring infection, pertussis, parapertussis, adenovirus, tuberculosis
Congenital Narrowing airway Aspiration Other	Aberrant innominate artery, vascular rings, bronchogenic cyst, esophageal duplication, subglottic stenosis, tracheomalacia, tracheal and bronchial stenosis Gastroesophageal reflux, esophageal incoordination, tracheoesophageal fistula, cleft larynx, vocal cord paralysis, pharyngeal incoordination, achalasia, cricopharyngeal achalasia Tracheobronchial tree abnormalities, cystic fibrosis, immotile cilia syndrome, congenital heart disease, bronchopulmonary dysplasia
Psychogenic	Psychogenic cough
Traumatic	Foreign bodies of bronchus, trachea, larynx, nose, external auditory canal
Environmental	Tobacco exposure, low humidity, overheating, allergens, industrial pollutants
Otologic	Cerumen, foreign body, infection, neoplasm, hair

Neoplastic	Larynx: Subglottic hemangioma, papillomatosis Tracheobronchial tree: Papillomatosis, bronchial adenoma Mediastinal tumor causing tracheobronchial compression
Cardiovascular	Rheumatic fever, congestive heart failure, mitral stenosis

Adapted from: Holinger 1986.[3]

RECOMMENDATIONS FROM OTHERS

A guideline from Finaldn suggests referral for investigations of asthma, allergy, and GERD. Infectious diseases, the presence of foreign bodies, and psychogenic causes should also be considered.[5]

CLINICAL COMMENTARY

Inquire about exposure to irritants, feeding habits, infection, family history of asthma

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A comprehensive detailed history is the first important diagnostic step in the approach to a chronic cough in a 1-year old. The primary care provider should inquire about the infant's exposure to environmental irritants such as tobacco smoke, their feeding habits, possible foreign-body aspiration, infectious exposure, and the family history of asthma. Environmental pollution in areas such as where I practice (Houston, Texas) can be a significant factor in evaluating infant with chronic cough. A chest radiograph should be considered after a thorough physical examination.

After an initial evaluation, further investigation should focus on the common causes of chronic cough such as postnasal drip, asthma, and GERD. Because of the high frequency of postnasal drip, the patient can be empirically started on antihistamine/decongestion combination. The primary care provider may consider an empirical treatment for gastroesophageal reflux disease if suggested by the history and physical examination. If no improvement is seen after several weeks, the patient should be referred to the appropriate specialist for evaluation of asthma, congenital anomalies, or other less common cause of chronic cough.

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