Chronic Cough: The Keys to Diagnostic and Therapeutic Success

The workup of a chronic cough may seem complex and many physicians approach a chronic cough with a certain degree of trepidation. Yet in most cases, chronic cough is caused by no more than three easily distinguishable conditions.

By Robert S. Hauptman, BMsc, MD

Case Study

One afternoon C.S., a three-year-old girl, presents to your office for evaluation of poorly-controlled asthma.

She recently moved to your community from Nova Scotia. Her parents inform you she has had a chronic recurrent cough for the past nine months.

Initially she was placed on antibiotics for bronchitis, but this did not relieve her cough. On further evaluation, her family physician felt she probably had asthma. C.S. was treated with salbutamol and beclomethasone puffers with some initial relief. Unfortunately, her cough has never fully gone away. Her parents wonder if she needs a change in her asthma medications or whether she should be referred to an asthma specialist.

What would you do next?

Introduction

Chronic cough is a frequently encountered presenting complaint for family physicians. A chronic cough by definition is any cough that is persistent or recurrent over a period of four to six weeks. Many physicians approach a chronic cough with a certain degree of trepidation. Clearly the workup of a chronic cough is treated in a complex fashion in many medical schools and textbooks. However, the majority of chronic coughs that present to a family physician in non-smoking individuals between the ages of three and 65 are caused by no more than three easily distinguishable conditions. They are asthma, postnasal drip (PND) and gastroesophageal reflux disease (GERD). The purpose of this article is to provide the reader with a simple and practical approach to identifying and treating these three common conditions.

Dr. Robert S. Hauptman is medical director of the Sturgeon Hospital Pediatric Asthma Program, St. Albert, Alberta, medical director of the Aspen Asthma Program, Morinville, Alberta, secretary-treasurer of the Family Physician Airways Group of Canada, and chairperson associate of the Medical Clinic, St. Albert, Alberta.

History, History, and yet more History

As with most conditions in medicine, the foundation to sorting out the causes of a chronic cough is a thorough history. In practice, the author finds that the history alone suggests the correct diagnosis more often than not. As a result, in the evaluation of a chronic cough in family practice, the majority of the appointment should be spent on compiling a comprehensive history.

Particular attention should be paid to the characteristics of the chronic cough. A pro-

Table 2.
DISTINGUISHING THE THREE COMMON CAUSES OF CHRONIC COUGH

Character of Cough	ASTHMA	POSTNASAL DRIP	GERD
Type of Cough	Dry, non-productive, hacking, croupy.	Wet, productive, phlegmy, clearing throat. Often dry but may be productive. Tickle in throat.	Often dry but may be productive. Tickle in throat.
Triggers	Environmental, allergens, exercise, smoke.	Environmental, allergens, exercise, smoke.	Meals.
Time of Day	Worse between 2 a.m. – 4 a.m.	Worse as the day goes on. Worse when lying down to go to bed at night and first thing in the morning.	Worse after eating large meals and when lying down to go to bed.
Associated features	History of atopy.	History of atopy or recurrent sinusitis.	History of obesity or recent weight gain
Treatment	B2-agonist or inhaled steroids.	Nasal steroids or antihistamines. Antibiotics if associated sinusitis.	Proton pump inhibitors.

ductive and phlegmy cough is typical of PND. A dry and hacking or croupy cough is frequently seen is asthma. PND coughs are usually worse first thing in the morning upon awakening, as well as when a patient lies down to go to sleep. Both asthma and PND coughs are nocturnal and often disrupt sleep. The distinguishing feature here is that patients with a PND cough are able to sleep through the night when they finally get to sleep, whereas asthmatics wake up after midnight with a dry and persistent cough and cannot get back to sleep. Both asthma and PND coughs can worsen during exercise, which often is not well-appreciated. The difference here is that the PND cough during exercise is again more productive than the dry, non-productive asthma cough.

The cough of GERD may be distinguished from PND and asthma by its association with heartburn and meals. GERD is also often seen more commonly in the overweight patient. The cough of GERD is a dry and non-productive cough, like asthma. Often patients describe a tickling sensation in their throats. Mention should be made of laryngopharyngeal reflux (LPR). This condition is basically GERD without the heartburn. LPR is a frequent cause of cough and should be considered in the evaluation of a chronic cough in older patients.

The cough of LPR is similar to the cough of GERD and responds well to a two-week therapeutic and diagnostic trial with a proton pump inhibitor. In most cases, if a chronic cough does not respond to a two-week course of a proton pump inhibitor, you can confidently rule out the diagnosis of GERD

Table 2.
INVESTIGATIONS OF A CHRONIC COUGH.

Always:	Chest X-ray
In Selected Cases:	Spirometry Sputum for Cytology Sinus X-ray Sweat Chloride Allergy Skin Tests Nasopharyngeal Swab for Pertussis Echocardiogram

or LPR.

In the case of C.S., further history revealed her cough was wet and productive sounding . Her parents noted she always seemed to be clearing mucous from her throat. Her cough was nocturnal and kept her up for at least one to two hours when she would lie down to try to sleep. However when C.S. would finally get to sleep she had no problems sleeping through the night.

For a quick reference to distinguishing the three common causes of chronic cough from each other, see Table 1.

The Pitfalls of the Physical Examination

In distinguishing between PND, asthma and GERD, the physical examination is often the least productive tool a family physician has. Quite often, the physical examination is normal. Physical findings that may help to point to the correct diagnosis include rhinitis, nasal mucosa swelling and PND when examining the pharynx, which are suggestive of PND. Wheeze on examination is obviously suggestive of asthma but usually the respiratory examination is normal. Abdominal examination revealing some epigastric tenderness and obesity may be seen in GERD and LPR but again the examination may be normal.

In the case of C.S., physical examination revealed a healthy looking girl. She had an occasional productive cough. Examination of the nose revealed marked purulent rhinnorhea and nasal mucosal swelling. On examination of the pharynx she had cobblestoning of the posterior pharynx suggestive of PND. Respiratory examination was normal.

Remember—although the physical examination may be helpful in sorting out the cause of a chronic cough it is often normal.

Investigations

Initial investigation of a chronic cough can usually be kept at a minimum. A chest X-ray should be done as a baseline investigation in all causes of chronic cough. This is particularly true for older patients, in whom cardiac pathology and malignancies are more common. Beyond the chest X-ray there are few tests that need to be ordered routinely. See Table 2.

Consider a sinus X-ray if suspecting PND from an infective sinusitis. Allergy skin tests may be indicated for the evaluation of asthma or PND from allergic rhinitis. Spirometry and peak flow monitoring should be done if the diagnosis of asthma is made. An upper GI series or gastroscopy may be useful in the evaluation

of GERD.

In the case of C.S., a chest and sinus X-ray was ordered. The chest X-ray was normal. The sinus X-ray revealed air fluid levels and mucosal swelling in the maxillary sinuses consistent with a sinusitis.

Confirming the Diagnosis

Generally at the end of a good history, the cause of a chronic cough should be apparent. Generally, therapy will resolve a chronic cough if the diagnosis based on the history is correct.

The three most common causes of a PND cough are infective sinusitis, allergic rhinitis and non-allergic rhinitis. If an infective sinusitis is suspected, a three- to six-week course of an appropriate antibiotic should quickly resolve the cough. Of course, this is a more prolonged antibiotic course than one would use in an acute sinusitis, but this is often required to treat the sinusitis in a chronic case. Both allergic rhinitis and non-allergic rhinitis coughs respond generally to a four- to six-week course of a topical nasal steroid. Improvement should be seen in the first week.

A chronic cough from asthma usually responds to an inhaled steroid. If high doses are initially used (fluticasone 250 µg four times a day or budesonide 400 µg four times a day) the cough often improves in a matter of days. B2-agonists, such as salbutamol, are less consistent in improving an asthma-related cough.

Both GERD and LPR respond dramatically to proton pump inhibitors such as omeprazole. In fact, the response may be seen in the first 24 hours of therapy. Occasionally higher than usual doses may be required to resolve a cough associated with reflux (i.e., omeprazole 20 milligrams BID). H2-antagomists such as ranitidine do not work as well for reflux associated coughs.

In the case of C.S., a diagnosis of chronic sinusitis was made by history and confirmed by sinus X-ray.

Her asthma medications were discontinued, and she was placed on a three-week course of clarithromycin. On a return visit one month later her cough was completely resolved. C.S. has now been cough free for six months.

Other Causes of Chronic Cough

There are obviously a number of other causes of chronic cough that a family physician may encounter.

However, these other causes clearly represent the minority of conditions that will present to your office. See Table 3.

It is important to remember foreign bod-

Table 2.
CAUSES OF CHRONIC COUGH BY AGE

Birth to Three Years of Age:	Three to 65 Years of Age:	Over 65 Years of Age:
Foreign Body	Asthma	Asthma
Reflux	Postnasal Drip	COPD
Cystic Fibrosis	GERD	Postnasal Drip
Whooping Cough	LPR	GERD
Asthma	Whooping Cough	LPR
Postnasal Drip	Medications including ACE I and B-blockers	Congestive Heart Failure
Congenital Heart Disease	Bronchiectasis	Valvular Heart Disease
	Vocal Cord Dysfunction	Cancer
	Psychogenic	Medications including ACE I and B-blockers

ies and cardiac causes, especially in patients younger than three years of age and older than 65 years of age, respectively. However as mentioned earlier, PND, asthma and GERD represent the vast majority of chronic coughs between the ages of three and 65.

A Word about Smokers

Smokers in all age groups should be viewed slightly differently. Although PND, asthma and GERD are still quite common in smokers, one should always be aware of the possibility of a malignancy.

In smokers with a chronic cough, a chest X-ray is mandatory. Sputum for cytology may be useful if a malignancy is a concern.

Also keep in mind the diagnosis of chronic obstructive pulmonary disease in a smoker.

Normal pulmonary function testing essentially rules out this diagnosis in a smoking patient.

Conclusion

Chronic cough is a common symptom. Although the causes for a chronic cough include a large number of conditions, practically speaking most causes will be from PND, asthma or GERD.

A thorough history should point to the cause of a chronic cough. If the cause is not apparent from the history, or a patient does not respond to therapy as expected, referral to a respirologist may be indicated. By following the suggested outline the vast majority of chronic coughs can be successfully diagnosed and managed by family physicians. Dx

Suggested Further Readings:
1. Paterson NA: Chronic Cough—Guidelines for Diagnosis and Management. The Canadian Journal of CME 1990; January/February: 19-25.
2. Bardana EJ, Braman SS, and Johnson JT: An assessment and management of the chronic cough. Patient Care 1990; April: 8-16.
3. Fishbein D: Treat underlying causes to corral that cough. Current Therapy 1990; March: 6-7.
4. Celli BR: The Importance of Spirometry in COPD and Asthma. Chest 2000; Supp 117/2: 15S-19S.