

# Causes of cough

Lorna Marie West BPharm(Hons), MSc Clin Pharm(Aberdeen)

Senior Clinical Pharmacist, Mater Dei Hospital, Tal-Qroqq, Malta  
Chairperson of Publications, Malta College of Pharmacy Practice  
Email: [lorna.m.west@gov.mt](mailto:lorna.m.west@gov.mt)

## Educational aims

- To have a better understanding of the various causes of cough
- To provide an overview of the different types of cough
- To enable better assessment of a patient presenting with cough

## Key words

cough, acute, chronic, productive, dry

**A cough, being acute or chronic, is a symptom of a variety of respiratory and non-respiratory conditions and pharmacists should be able to distinguish between a cough not resulting from a serious pathology and one which could be the underlying symptom of a potentially critical condition.**

## Introduction

Patients frequently present to pharmacists requesting medications which can relieve cough, describing it mainly as productive or dry. A cough is a symptom of a variety of respiratory and non-respiratory conditions<sup>1</sup> which could be both mild and serious in nature and can be described as “a forced expulsive manoeuvre or manoeuvres against a closed glottis that are associated with a characteristic sound or sounds”.<sup>2</sup>

Causes of cough can range from a common cold to malignancy and pharmacists should be able to distinguish between a cough not resulting from a serious pathology and one which could be the underlying symptom of a potentially critical condition. Studies have shown that the reporting of cough is more prevalent in females than males, possibly due to an increased sensitivity of cough reflex in women.<sup>3</sup>

## Types of cough

An acute cough is often the result of an upper respiratory tract infection and although distressing it is usually self-limiting and does not require any medical intervention. An acute cough is defined as one lasting less than three weeks. When a patient presents with an acute cough the pharmacist should still enquire about haemoptysis, the possibility of an inhaled foreign body and prominent systemic illness since cough can be the first indication of an underlying serious condition.<sup>4</sup> Table 1 refers to some of those instances when the pharmacist should refer the patient to a doctor. Common causes of an acute cough are upper respiratory tract infections, exacerbations of chronic obstructive pulmonary disease (COPD), allergic rhinitis, and rhinitis due to environmental irritants<sup>5</sup> and asthma which is not well controlled.

A chronic cough is one which lasts more than 8 weeks and accounts for one-tenth of respiratory referrals to secondary care.<sup>4</sup> Cough lasting between three to eight weeks is defined as subacute cough.<sup>5</sup> In general, most chronic coughs are dry or minimally productive in nature although some pathologies result in a chronic cough with the presence of significant sputum production. Although chronic cough is perceived as trivial, it can be a disabling symptom associated with significant morbidity. Pharmacists should perform a detailed history in all patients presenting with a chronic cough as explained in Table 2 and should refer such patients to a specialist. Chronic cough would have started off as an acute cough and therefore it is important to identify the exact duration of this symptom so as to narrow the list of possible causes. Some of the most common causes of chronic cough in immunocompetent patients are asthma, gastro oesophageal reflux disease, chronic bronchitis due to cigarette smoking and other irritants, bronchiectasis, eosinophilic bronchitis, postnasal-drip syndrome from conditions of the nose and sinuses, or the use of an angiotensin-converting-enzyme (ACE) inhibitor.<sup>5</sup>

Some physical symptoms can occur as a consequence of cough, such as musculoskeletal pains, hoarseness, stress incontinence, blackouts and vomiting. Therefore, patients presenting with an unknown cause of the afore-mentioned physical symptoms should be asked about a history of coughing. Coughing can

potentially result in psychological distress such as depression and can have an impact on the patient's social well being such as avoidance of public places.<sup>4</sup>

### Common causes of cough

When patients present with a troublesome cough, their main goal is to eliminate the symptom as quickly as possible.<sup>1</sup> Patients may have more than one factor contributing simultaneously to cough. Treatment for the different aetiologies described below may not always be as simple as dispensing a cough preparation. Treatment of different conditions may vary from the prescribing of antihistamines and nasal decongestants to the use of inhaled or oral corticosteroids or at times antibiotics. At other times patients presenting with cough will require complex treatment depending on the underlying condition. Moreover, the FDA strongly recommends that infants and children under 2 years of age should not be given over the counter cough preparations.<sup>6</sup> The aim of this paper is to emphasise that there are multiple contributing factors to cough and that it should not always be treated empirically with cough preparations.

The following are just a few of the most common causes of cough:

- **Angiotensin-Converting-Enzyme (ACE) Inhibitor induced cough**  
One of the most common causes of a dry, non-productive persistent cough, which could be easily detected by a pharmacist, is the one caused by angiotensin-converting-enzyme (ACE) inhibitors. ACE inhibitors can cause bradykinin accumulation within the upper airway and decreased metabolism of proinflammatory mediators, and can therefore act as irritant substances in the airways to increase bronchial reactivity and induce cough. ACE inhibitor-induced cough can present a few hours and up to months after initiation of treatment. Cessation of ACE inhibitor therapy will result in cough resolution. However, cough can take up to few months to resolve.<sup>7</sup> Since cough due to ACE inhibitors is a class-effect and not dose-related, substituting one ACE inhibitor for another might not improve the cough. Therefore, the ACE inhibitor should be substituted by an angiotensin II receptor antagonist in an attempt to resolve the cough.<sup>8</sup>

**Table 1. Symptoms associated with acute cough which require prompt referral**

**Patients presenting to a pharmacy with an acute cough should be referred when one of the following is also present<sup>4</sup>:**

- Fever
- Haemoptysis
- Shortness of breath
- Chest pain
- Weight loss

**Table 2. In a patient presenting with a chronic cough the pharmacist should determine<sup>4</sup>:**

- Age and gender
- Smoking status
- Onset of cough
- Duration of cough
- Cough in relation to infection
- Presence of sputum
- Diurnal variation in cough
- Severe coughing spasms/paroxysms
- Incontinence
- Cough triggers and aggravants
- Cough related to posture
- Cough in relation to food
- Cough on phonation
- Medication
- Environment/ occupation/pets
- Past medical history
- Family history

- **Asthma, COPD, Acute bronchitis, Chronic bronchitis and Eosinophilic bronchitis**  
Acute cough is one of the most common symptoms associated with loss of asthma control, acute exacerbations of asthma and COPD. In cough variant asthma, cough may be the only presenting manifestation<sup>5</sup> and the treatment is the same as asthma in general.<sup>8</sup> The most common cause of COPD is cigarette smoking. Common signs and symptoms of COPD are shortness of breath, cough and/or mucus production.<sup>9</sup> Routine treatment with antibiotics in these patients is not justified. Acute bronchitis is an acute respiratory infection with a normal chest radiograph that is manifested by cough with or without phlegm production that lasts up to three weeks.<sup>10</sup> Most patients with acute bronchitis should not be given  $\beta$ 2-agonist bronchodilators to alleviate cough. In acute bronchitis patients may insist on receiving an antibiotic. The decision of whether to use antibiotic or not should be addressed individually and explanations should be given to the patient.<sup>11</sup> Chronic bronchitis is a condition that is manifested by cough and sputum expectoration occurring on most days for at least 3 months of the year and for at least 2 consecutive

years when other respiratory or cardiac causes for the chronic productive cough are excluded.<sup>12</sup> Non-asthmatic eosinophilic bronchitis is characterised by the presence of eosinophilic airway inflammation similar to that seen in asthma.<sup>13</sup> It is a cause of chronic cough which is distinct from asthma since it is not associated with bronchial hyperresponsiveness or variable airflow obstruction.<sup>5,8</sup> Cough associated with eosinophilic bronchitis can be dry as well as productive in nature. Respiratory irritants, such as personal tobacco use and passive smoke exposure, should be avoided.

- **Environment and smoking induced cough**  
Exposure to pollutants and environmental irritants can be a cause of chronic cough.<sup>4</sup> One of the commonest causes of a persistent cough is smoking. One study observed nocturnal cough in relation to indoor exposure to cat allergens.<sup>14</sup> Therefore, patients presenting with cough should be asked about occupational and environmental causes.
- **Gastro-oesophageal reflux disease (GORD)**  
Gastro-oesophageal reflux disease, alone or in combination with other conditions, is one of the most common causes of

chronic cough. A cough in the absence of gastrointestinal symptoms may be the only presenting complaint in patients suffering from GORD, since there may be no gastrointestinal symptoms up to 75% of the time.<sup>15</sup> It may take two to three months of intensive medical therapy before cough starts to improve and on average five to six months before the cough resolves.<sup>5</sup> Therefore, it is incorrect to assume that cough is not caused by GORD when gastrointestinal symptoms improve or disappear but the cough remains unchanged.<sup>8</sup> When treating GORD other co-morbidities have to be kept in mind such as obstructive sleep apnoea or coronary artery disease.

- *Heart failure*

Acute cough can be the presenting sign of heart failure in patients who have pulmonary congestion.<sup>7</sup> Therefore, since cough can be a symptom of pulmonary oedema it is important to have a high index of suspicion of left ventricular heart failure in elderly patients presenting with a new or worsening cough, and refer such patients to a specialist.<sup>5</sup>

- *Malignancy*

Patients presenting with cough and have risk factors for lung cancer should be referred to a specialist. Cough may be due to the cancer itself, the treatment, or other co-existing disease.<sup>4</sup> Malignancies which arise in other organs will often metastasize to the lungs<sup>16</sup> and therefore patients with a history of a malignancy should be referred for specialist advice.

- *Upper respiratory tract infections*

Upper respiratory tract viral infections are one of the most common causes of acute cough, which appears to arise from the stimulation of the cough reflex in the upper respiratory tract by postnasal drip, clearing of the throat, or both.<sup>5</sup> Post-infectious cough starts with an acute respiratory tract infection that is not complicated by pneumonia and ultimately resolves without treatment.<sup>5</sup> A post-infectious cough is present for at least 3 weeks following an acute respiratory infection, but not more than 8 weeks. There are multiple pathogenic factors which may contribute to the cause of cough and therefore therapy depends on the cough provoking factor.

### Practice points

- An acute cough is one lasting less than three weeks whilst a chronic cough is one which lasts more than 8 weeks<sup>4</sup>
- The pharmacist should enquire about haemoptysis, the possibility of an inhaled foreign body and prominent systemic illness in a patient with an acute cough<sup>4</sup>
- Pharmacists should perform a detailed history in all patients presenting with a chronic cough and should refer such patients to a specialist
- There are multiple contributing factors to cough and pharmacists should not always treat empirically with cough preparations
- Infants and children under 2 years of age should not be given over the counter cough preparations<sup>6</sup>

### Conclusion

Coughing is a distressing symptom and chronic cough is an important medical and economic problem.<sup>17</sup> In patients complaining of cough the pharmacist should evaluate for a variety of complications associated

with coughing<sup>11</sup> prior to dispensing cough preparations. Moreover, the pharmacist should refer patients for specialist advice when there is the possibility of an underlying condition.

### References

1. Pratter MR, Abouzgheib W. "Make the cough go away". <http://www.chestjournal.chestpubs.org/129/5/1121.full> Last accessed on 22nd May 2010
2. Morice AH, Fontana GA, Belvisi MG, et al. ERS guidelines on the assessment of cough. *European Respiratory Journal* 2007; 29: 1256-1276
3. Fujimura M, Kasahara K, Kamio Y, et al. Female gender as a determinant of cough threshold to inhaled capsaicin. *European Respiratory Journal* 1996; 9: 1624-1626
4. Morice AH, McGarvey L, Pavord I. BTS guidelines. Recommendations for the management of cough in adults. *Thorax* 2006; 61(suppl 1): i1-i24
5. Irwin RS, Madison JM. The diagnosis and treatment of cough. *The New England Journal of Medicine* 2000; 343(23): 1715-1721
6. U.S. Food and Drug Administration. Public Health Advisory: FDA recommends that over-the-counter (OTC) cough and cold products not be used for infants and children under 2 years of age. <http://www.fda.gov/drugs/drugsafety/publichealthadvisories/ucm051137.html> Last accessed on 30th May 2010
7. Koda-Kimble MA, Young LY. Heart failure. *Applied Therapeutics. The Clinical Use of Drugs*. Lipincott Williams & Wilkins, USA, 2008: 18-17, 18-32
8. Irwin RS, Madison JM. The persistently troublesome cough. *American Journal of Respiratory and Critical Care Medicine* 2002; 165: 1469-1474
9. American Thoracic Society. Chronic Obstructive Pulmonary Disease (COPD). *American Journal of Respiratory and Critical Care Medicine* 2005; 171: P3-P4
10. Braman SS. Chronic cough due to acute bronchitis: ACCP evidence-based clinical practice guidelines. *Chest* 2006; 129(suppl 1): 95S-103S
11. Irwin RS, Baumann MH, Boulet LP, et al. Diagnosis and management of cough executive summary. ACCP evidence-based clinical practice guidelines. *Chest* 2006; 129(suppl 1): 1S-23S
12. Braman SS. Chronic cough due to chronic bronchitis: ACCP evidence-based clinical practice guidelines. *Chest* 2006; 129(suppl 1): 104S-115S
13. Brightling CE. Chronic cough due to nonasthmatic eosinophilic bronchitis: ACCP evidence-based clinical practice guidelines. *Chest* 2006; 129(suppl 1): 116S-121S
14. Gehring U, Heinrich J, Jacob B, et al. Respiratory symptoms in relation to indoor exposure to mite and cat allergens and endotoxins. *Indoor Factors and Genetics in Asthma (INGA) Study Group*. *European Respiratory Journal* 2001; 18: 555-563
15. Irwin RS. Chronic cough due to gastroesophageal reflux disease: ACCP evidence-based clinical practice guidelines. *Chest* 2006; 129(suppl 1): 80S-94S
16. Kvale PA. Chronic cough due to lung tumours: ACCP evidence-based clinical practice guidelines. *Chest* 2006; 129 (suppl 1): 147S-153S
17. Pratter MR, Bartter T, Akers S, et al. An algorithmic approach to chronic cough. *Annals of Internal Medicine* 1993; 119(10): 977-983