

Cough

Cough is a reflex action to remove secretions or foreign material from the airways ⁽¹⁾. The **majority** of coughs presenting in the pharmacy will be caused by a **viral** upper respiratory tract infections (URTIs) ⁽²⁾.

Types of cough

1-Productive (wet, chesty) cough: A productive cough expels secretions from the lower respiratory tract that if retained, could impair ventilation and the lungs' ability to resist infections ⁽³⁾.

2-Nonproductive (dry) cough: in which no sputum is produced ⁽²⁾ and has no physiologic purpose ⁽³⁾. **These cough are usually caused by viral infections and are usually self-limiting** ⁽²⁾.

3-Chesty-Nonproductive: Many patients say that they are not producing sputum and they say that they can "feel it on their chest ", ⁽⁴⁾ where there is congestion on the chest but no mucus is produced, and this should be treated as a productive rather than non-productive cough ^(4, 5).

Patient assessment of cough

A-Duration

Most coughs are self-limiting and will be better within a few days with or without treatment. In general cough of longer than **2-3** weeks duration should be referred to the Dr. for further investigations ⁽²⁾.

B-Nature of cough

1-Whether the cough is dry or wet. If it is wet then we ask about the color of the sputum. **Non-colored** (clear or whitish) sputum is known as mucoid ⁽²⁾. Mucoid (clear and white) is normally of little consequence and suggests that no infection is present. Yellow, green or brown sputum normally indicates infection ⁽⁴⁾. **Colored sputum is common and, in most cases, does not mean that antibiotic therapy is needed** ⁽²⁾.

2-Colored sputum may be more useful as a sign in people who have other lung complications. For example, in people with **Chronic obstructive pulmonary disease (COPD)**, an exacerbation of their condition with more purulent sputum (e.g. a change in color to green or yellow) may be a sign that there are bacteria involved and hence antibiotics may be indicated (**referral**) ⁽²⁾.

C-Associated Symptoms:

1-Chronic cough with haemoptysis associated with chronic fever, weight loss and night sweats are classical symptoms of tuberculosis (TB) ^(2, 4). Patient with suspected TB required referral.

2-A recurrent night-time cough especially in children with or without wheezing may indicate Asthma and should be referred. Especially if there is a family history of eczema, asthma, hay fever ... ⁽²⁾.

Note: Night cough in children is fairly common in association with a cold but in the absence of cold symptoms could indicate asthma ⁽¹⁾. (Symptom of cold include: sore throat, Runny / congested (or blocked) nose...).

3-Cough with clear frothy sputum, breathlessness (especially in bed during the night) may indicate heart failure and required referral for further investigations.

(Note: other symptom of heart failure may be **swollen ankles**). (if there is a history of heart disease especially with a persisting cough, then referral is advisable ⁽¹⁾).

4-Upper airways cough syndrome (UACS) (previously referred to as postnasal drip; also referred to as rhinosinusitis):

It is a common cause of coughing ⁽¹⁾.(UACS is characterized by a nasal discharge that flows behind the nose and into the throat. Patient present with swallowing mucus or frequent clearing of the throat more than usual ⁽⁴⁾). Allergies are one cause of UACS. If UACS is present, it is better to direct treatment at the cause of the UACS (e.g. antihistamines or decongestants) rather than just treat the cough) ⁽⁴⁾.

5-Chest pain, shortness of breath (SOB), wheezing, whooping

These symptoms required referral for further investigations ⁽¹⁾.

6-Croup:

Croup usually occurs in infants. The cough has a harsh barking quality It develops 1 day or so after the onset of cold-like symptoms. It is often associated with difficulty in breathing and an inspiratory stridor (noise in throat on breathing in). **Referral is necessary** ⁽²⁾.

7-Coughing during the recumbent (supine, lying down), with heartburn may indicate Gastro esophageal reflux disease (GERD) which may be improved by with acid lowering drugs ^(2,3). (see chapter one).

8-Smoking: Patient who smokes is more prone to chronic recurrent cough. Over time this might be develops into chronic bronchitis or emphysema ⁽⁴⁾.

A change in the nature of a smoker's cough (e.g. more productive or frequent, or a different sound) may suggest malignancy. So, a smoker's cough that has changed in nature required referral ⁽⁵⁾.

D-Medication:

1-If one or more appropriate remedies have been tried without success (failed medication); then referral for further investigations ⁽¹⁾.

2-Drug-induced cough: e.g.:

Angiotensin-converting enzyme (ACE) inhibitors (e.g. Lisinopril, Enalapril ...) cause dry cough in approximately 20% of treated patients ⁽³⁾(especially women), Patients may develop the cough within days of starting treatment or after a period of a few weeks or even months. refer and suggest the alternative: Angiotensin –II receptor antagonists (valsartan, losartan...) ⁽¹⁾.

When to refer

Cough lasting 2–3 weeks or more and not improving
Cough associated with significant fever, malaise or feeling of being unwell
Distressing cough in frail, older people
Concern about comorbidity, such as diabetes or heart disease
Sputum (purulent sputum in COPD), rusty or bloodstained
Haemoptysis – blood in sputum, coughing blood
Chest pain
Shortness of breath
Wheezing
Whooping cough or croup
Recurrent nocturnal cough
Suspected adverse drug reaction, ACE inhibitors
Failed medication

After a series of questions, the pharmacist should be in a position to decide whether treatment or referral is the best option.

Treatment timescale ⁽²⁾.

Depending on the length of time the patient has had the cough and once the pharmacist has recommended an appropriate treatment, the patient should see their doctor 2–3 weeks after the cough started if it has not improved or sooner if it is getting worse.

Management

Non-drug measures:

1-Demulcents:

Nonmedicated lozenges may reduce cough by decreasing throat irritation ⁽³⁾.

Demulcents may contain ingredients such as honey and lemon, or glycerol. They are thought to coat the pharyngeal mucosa, soothing inflammation and reducing irritation, and can be used to **treat both productive and non-productive coughs** ⁽⁵⁾.

They are usually harmless and cheap and have a useful placebo effect. They can be used for any type of cough ⁽⁶⁾. (They considered to be safe in children and pregnant women) ⁽²⁾ but should not be given to children under three years of age because of the risk of choking ⁽⁵⁾. If recommended they should be given 3-4 times daily ⁽⁴⁾.

*General advice to patient with cough and cold is **to increase fluid intake** ⁽²⁾.

Non-prescription medications:

Notes:

1-The **evidence** to support the use of cough suppressants and expectorants to relieve symptoms **is not strong**, but some patients find them helpful ⁽²⁾.

2-In short-term acute conditions, the **amount of sugar in cough medicines is relatively unimportant**. Nevertheless, many diabetic patients may prefer a sugar-free product, as will many other customers who wish to reduce sugar intake for themselves and their children, and many such products are now available ⁽²⁾.

A-Antitussive (cough suppressants): Codeine, Pholcodeine and dextromethorphan are used for dry cough. Although all three may be effective, dextromethorphan and Pholcodeine have a lower risk of constipation and dependence developing. In addition, both pholcodeine and codeine can cause drowsiness whereas dextromethorphan is non-sedating in most people ⁽⁵⁾.

1-Codeine:

The FDA recommended that the use of codeine-containing cough medicines should be contraindicated **in children younger than 18 years** ⁽⁷⁾.

Side effects: even at OTC doses codeine can cause constipation and at high doses, respiratory depression ⁽²⁾, therefore it is best avoided in patients with impaired respiratory function e.g. **Asthma** ⁽³⁾.

However, in practice this is very rarely observed and does not preclude the use of cough suppressant in asthmatic patients) ⁽⁴⁾.

Notes:

1-Codeine is well known as a drug of **abuse** and sales must be refused because of knowledge or likelihood of abuse) ⁽²⁾.

2-Dextromethorphan:

Generally it is considered non-sedating and has fewer side effects and thought to have a low potential for abuse ⁽¹⁾. Its use should be avoided in children younger than 12 years ⁽²⁾.

Dose ^(3, 8):

Adults: 10-20 mg every 4 hours or 30 mg every 6-8 hours (maximum 120 mg/ day).

3-Diphenhydramine: Which is one of the sedating antihistamines. (**Further reading-1**)

4-Pholcodeine : (**Further reading-2**)

B-Expectorants and Mucolytics: which are used for wet cough.

1-Glyceryl guaiacolate (also called **Guaifenesin**): Which is the only FDA approved OTC expectorant ⁽³⁾. Doses ⁽³⁾:

Adults: 200-400 mg every 4 hours (maximum 2.4 g/day). Children aged 6–12 years: 100-200 mg every 4 hours (maximum 1.2 g/day).

2-Bromhexine :

Bromhexine is a mucolytic used in the treatment of respiratory disorders associated with productive cough. It is usually given orally in a dose of 8-16 mg three times daily ⁽¹⁰⁾.

C-Additional Constituents:

1-Theophylline: which is one of the bronchodilators, and it is available in some OTC products but it is best **avoided** because patients requiring medication to help with shortness of breath (SOB) or wheeze are best referred ⁽⁴⁾ (**Further reading-3**)

2-Sympathomimetics (e.g. Pseudoephedrine and Phenylephrine): these are commonly included in cough and cold remedies for their bronchodilator and decongestant actions ⁽²⁾.

They may be useful if the patient has blocked nose as well as cough, but they can increase the BP, stimulate the heart, and alter the diabetic control ⁽²⁾; therefore they are not recommended for patients with :

Coronary artery diseases (Angina, MI,), hypertension, diabetes mellitus, and hyperthyroidism (raised level of thyroid hormone increase adrenoceptors sensitivity and hence put patients at more risk of cardiac effects if sympathomimetics are used ⁽⁵⁾).

3-Sedating Antihistamine: like Diphenhydramine, and chlorphenamine,....., which may be added to antitussives (combination with expectorant is illogical) and they are effective especially if the dry cough is disturbing sleep ⁽²⁾.

Side effects: include sedation and drowsiness and anticholinergic side effects (i.e. dry mouth, urinary retention, constipation,)⁽⁴⁾.

They are not recommended for patients with **glaucoma or prostate hypertrophy** ^(1,4).

Note: Non-sedating antihistamines are **less effective** for cough ⁽²⁾.

Restriction on the use of cough and cold medicines in children

1-Children under 6 years should not be given OTC cough and cold medicines containing the listed ingredients in table 1 ⁽⁹⁾. (**Further reading-4**)

Table 1: Over the counter cough and cold medicines for children ⁽⁹⁾

1-Children under 6 years should not be given OTC cough and cold medicines containing the following ingredients:

- Brompheniramine, chlorphenamine, diphenhydramine, doxylamine, promethazine, or triprolidine (antihistamines); Dextromethorphan or pholcodine (cough suppressants); Guaifenesin (expectorants);
- Phenylephrine, pseudoephedrine, ephedrine, oxymetazoline, or xylometazoline (decongestants).

2-Children should not be given more than 1 cough or cold preparation at a time because different brands may contain the same active ingredient ⁽⁹⁾.

3-OTC cough and cold medicines can be considered for children **aged 6–12 years after** basic principles of **best care have been tried**, but treatment should be restricted to five days or less ⁽⁹⁾.

Best practice for treating cough and cold ⁽¹¹⁾

Current advice on **treating colds and coughs in children** includes:

1-**Giving fluids**

2-Treating fever and pain with **paracetamol or ibuprofen**.

3-The use of **saline drops** to loosen dried nasal secretions or help a stuffy nose in young children and babies.

4-Simple cough mixtures containing a **demulcent**, for example **glycerin**, and syrup can have a soothing effect by coating the throat and relieving the irritation which causes the cough.

5-A child over the age of one may also be helped by a **warm drink of lemon and honey**.

If a cough as a result of a viral infection does not go after 2 weeks a doctor should be consulted.

References

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- 10-Sean C. Sweetman. Martindale: The Complete Drug Reference, 36th edition. Pharmaceutical Press 2009.
- 11-Overview – risk: benefit of OTC cough and cold medicines in children. Available at: <http://medpdfnews.com/s/sepexpal.org1.html>. Accessed (5/6/2018).

Further reading

- 1-The *antitussive* doses are ⁽³⁾:
Adults: 25 mg every 4 hours (maximum 150 mg/day). children aged 6–12 years: 5- 12.5 mg every 4 hours (maximum 75 mg/day).
- 2-The adult dose is 5 to 10 mg 3-4 times a day. Most marketed products now state avoidance in children but British National Formulary (BNF-83) still states that it can be given to children aged 6 years and over (dose 6-11 year: 2–5 mg 3–4 times a day) ^(4, 9).
- 3-In view of the problems associated with theophylline, and the availability of a wide range of alternative treatments, it would seem best not to recommend any theophylline-containing OTC product ⁽⁵⁾.
- 4-The reasons behind the restriction on the use of cough and cold medicines in children are ⁽¹¹⁾:
 - 1-Children under the age of 6 years generally **have more colds compared to older children** and therefore, are likely to be exposed more frequently to these medications.
 - 2- There is **no robust evidence that cold and cough medicines containing the above ingredients work (placebo effect)**.
 - 3-They may produce **side effects** in young children and may **cause poisoning** if a child accidentally swallows more than the recommended dose
 - 4-Younger children are **less likely to be able to communicate a potential side-effect** from a cough and cold medicine and to ask their parents/caregivers for help in the same way a child over the age of 6 can.

وفيما يلي ملخصاً بالأسئلة التي يسألها الصيدلي لمن يعاني من السعال(خاص بالعملي):

ماذا نسأل عن السعال

- 1-من هو المريض وكم عمره؟(وان كانت امرأة في سن الإنجاب نسأل إن كانت حاملاً أو مرضعاً؟)
- 2-منذ متى تعاني من السعال؟
- 3-ماهي طبيعة السعال (جاف أم يحتوي على بلغم؟) وفي حالة احتوائه على بلغم فما هو لون البلغم؟
- 4-هل تعاني من أمراض أخرى؟ ماهي؟ وما هي الأدوية التي تستعملها لعلاج هذه الأمراض؟ منذ متى وأنت تستعملها؟
- 5-هل استعملت أدوية لعلاج نوبة السعال هذه؟ ماهي؟ منذ متى بدأت استعمالها؟ وما هي النتيجة؟
- 6-هل توجد هناك أعراض أخرى مصاحبة للسعال(مثلاً: حمى, تعرق ليلي, صعوبة في التنفس, ألم في الصدر, الخ)؟
- 7-هل تختلف شدة السعال في الليل عما هي في النهار (خصوصاً للأطفال)؟ وهل تزداد شدة السعال عندك أثناء تمددك في الفراش (خصوصاً لكبار السن والمصابين بأمراض القلب)؟
- 8-هل تدخن؟ (وإذا كنت مدخناً فهل إن طبيعة السعال هذه المرة مغايرة للنوبات السابقة)؟