



## Winter coughs and effective mucus clearance

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### Introduction

Having a respiratory ailment such as a cough is a common complaint, especially during the winter months. Most coughs are caused by a viral upper respiratory tract infection and will be associated with other symptoms of a cold. Colds are transmitted during close human contact and causative viruses are spread by direct contact with the secretions which accompany sneezing or coughing.

### Overview

A cough is a sudden, forceful expulsion of air from the lungs which is caused when the airway is obstructed or irritated. Its function is to clear matter such as mucus (sputum) from the upper airways, and to protect the lungs from particles which have been inhaled.

Upper respiratory tract infections (URTIs) affect the throat, windpipe and sinuses. Should these conditions worsen, they could well develop into lower respiratory tract infections (LRTIs) which affect the lungs or lower airways. These infections include acute conditions such as bronchitis and pneumonia and may require medical attention.

### Types of cough

Coughs fall into two main categories.

**Unproductive** coughs are dry, tickly or tight, and do not produce sputum. They are usually caused by viral infection and are self-limiting.

**Productive** coughs are “loose”, and sputum is produced which is often referred to as “mucus.” It is an oversecretion of sputum which causes coughing. Oversecretion may be caused by irritation of the airways from factors such as infection, a post-nasal drip, and smoking. Mucus which is clear and whitish is uninfected, whereas coloured mucus may indicate infection and requires referral.

### Management

Although over-the-counter (OTC) cough preparations are widely used to relieve coughs, their clinical efficacy is debatable. The use of polycomponent preparations is not recommended. Some preparations may contain ingredients with opposing pharmacological effects, and they may contain components in inappropriate doses.

**Dry coughs** may be relieved by demulcents such as Simple Linctus. Should this not be helpful, and should sleep be disturbed, a cough suppressant such as dextromethorphan could be considered for a few nights.

A **productive cough** should not be suppressed since this may lead to retention of mucus and encourage the development of infection. The objective when treating a productive cough is to reduce the viscosity of mucous secretions so that the material can be easily coughed up. In this regard it should be borne in mind that adequate hydration is important to reduce mucus viscosity.

Agents which may be helpful when trying to relieve a productive cough include expectorants and mucolytics. These are available OTC in various formulations including liquids, effervescent tablets and lozenges for oral use.

**Expectorants** help to liquefy mucus making it easier to cough up. They may also block the production of mucins, which are the main protein found in mucus. Guaifenesin is an example of a commonly used expectorant.

**Mucolytics** may be helpful in cases of tenacious sputum production. Examples include acetylcysteine and carbocysteine which are thought to act by splitting chemical bonds in the mucus to reduce the viscosity of secretions and facilitate the coughing process.

Hedera helix is a herbal-based cough remedy which has shown mucolytic properties. Preparations contain extracts from the leaves of the ivy Hedera helix, and although they are widely used, their clinical effectiveness has not been established.

Bromhexine and mesna are widely used as mucolytics and may be beneficial in liquefying sputum. Bromhexine is available in solution form for inhalation from a respirator and is suitable for adults and children. Mesna is used for nasal obstruction due to thick secretions and is available as a nasal spray for adult use.

When considering any OTC preparation to relieve a cough, the manufacturer's recommendations should be strictly observed in respect of dosages and use in children and pregnant women.

**Therapeutic techniques** which can be learnt and carried out at home may be considered to improve mucus clearance. These are particularly useful when treating excess mucus build up in certain chronic lung diseases such as bronchiectasis and chronic obstructive pulmonary disease (COPD).

Controlled coughing is a technique which engages the chest and stomach muscles so that mucus clearance is improved. Two common methods of controlled coughing are deep coughing and huff coughing. Deep breathing exercises involve using modifications in physical positioning to clear lung secretions. Chest physiotherapy (CPT) includes techniques which are performed either manually or with a mechanical device to loosen mucus and facilitate coughing. Hand-held airway devices are available as machines which use techniques such as sound waves to break up mucus.

These techniques would best be initiated by a doctor or respiratory therapist.

### Home remedies

- Drink plenty of water to maintain adequate hydration. Drinking warm liquids such as water, tea, broth, or hot water with lemon may help loosen thickened mucous.
- Introduce warm air into the nasal passages by using devices such as a cool-mist humidifier or steam vaporiser.
- Take a hot shower or breathe in steam from a container of simmering water.

### See a doctor if there is:

- Shortness of breath, wheezing or chest pain
- High fever

- A cough which lasts two weeks or more and is particularly severe
- Blood in the sputum
- Unexplained weight loss

### Prevention

Hands should be washed often, particularly in cold and flu season. Avoid people who have colds or flu. Stop smoking and avoid second-hand smoke. Consider having a flu vaccine.

### Conclusion

Winter coughs are usually caused by viral infections of the upper respiratory tract. Coughs may be non-productive or may produce mucus. Facilitating the expectoration of mucus is important to help prevent complications such as pneumonia and bronchitis. If the pharmacist's assistant is unsure about which medicine to give, the patient must be referred to the pharmacist. If coughs do not respond to conservative treatment, the pharmacist will advise the patient to consult a doctor.

### Bibliography

1. NHS inform. Cough. NHS 24 [homepage on the Internet]. [Updated 13 Mar 2020, accessed 13 Mar 2020]. Available from: <https://www.nhsinform.scot/illnesses-and-conditions/lungs-and-airways/cough>.
2. Van Zyl-Smit R. Types of cough. Health24 [homepage on the Internet]. [Updated Feb 2018, accessed 05 Mar 2020]. Available from: <https://www.health24.com/Medical/Cough/Overview/Types-of-cough-20120721FAIR>.
3. Dezube R. Cough in Adults. Merck Manual Consumer Version [homepage on the Internet]. [Updated Feb 2020, accessed 05 Mar 2020]. Available from: <https://www.msdmanuals.com/home/lung-and-airway-disorders/symptoms-of-lung-disorders/cough-in-adults?query=Cough%20in%20Adults>.
4. Leader D. How increased mucus in the lungs is treated. Verywellhealth [homepage on the Internet]. [Updated 30 Nov 2019, accessed 10 Mar 2020]. Available from: <https://www.verywellhealth.com/five-techniques-to-clear-mucus-from-the-lungs-914841>.
5. Warren-Brown G. Conditions that may be causing your cough. Clicks [homepage on the Internet]. [Updated 21 May 2012, accessed 03 Mar 2020]. Available from: <https://clicks.co.za/health/article-view/why-am-i-coughing>.
6. Blake T (Reviewer). Cough. Clicks [homepage on the Internet]. [Updated Dec 2015, accessed 05 Mar 2020]. Available from: <https://clicks.co.za/health/conditions/article-view/cough>.
7. Holzinger F, Chenot J. Systematic review of clinical trials assessing the effectiveness of ivy leaf (Hedera helix) for acute upper respiratory tract infection. Evidence-based complementary and alternative medicine (eCAM) [homepage on the Internet]. [Published 03 Oct 2010, accessed 11 Mar 2020]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2957147/>.
8. Blenkinsopp A, Paxton P, Blenkinsopp J. Symptoms in the pharmacy: a guide to the management of common illness. 5th ed. New York:Wiley Blackwell, 2005.
9. Rossiter D, editor. South African Medicines Formulary. 12th edition. Cape Town: Health and Medical Publishing Group, 2016.
10. Van Schoor J. Cough syrups for a dry cough. SAPA. Winter 2016;16(2):24-25.