

3

Respiratory System

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Sneezing, congestion, rhinorrhoea, fever	40	Cough and sore throat	47
Case study	40	Case study	47
Assessing symptoms	40	Assessing symptoms	48
Accompanying symptoms	42	Accompanying symptoms	51
Management options	42	Management options	53
Re-consider the case	45	Re-consider the case	55

This chapter will cover the following conditions:

- Cough
- Sinusitis
- Hay fever/allergic rhinitis
- Flu/influenza
- Common cold
- Sore throat
- Tonsillitis
- Croup
- Whooping cough

This chapter will cover the following groups of medicines:

- Demulcents
- Expectorants
- Cough suppressants
- Antihistamines
- Decongestants (topical and oral)
- Nasal corticosteroids
- Sodium cromoglicate

In this chapter we will consider the symptoms of common minor illnesses of the respiratory tract that are encountered in pharmacies and the major diseases that these need to be differentiated from. This chapter will also consider general approaches to dealing with these conditions and the specific groups of drugs that can be used to manage these conditions.

The respiratory system's main role is to absorb oxygen from the atmosphere and to remove waste

gases from the body, primarily carbon dioxide. The respiratory tract can be separated into the upper respiratory tract comprising the nasal cavity, pharynx and larynx, and the lower respiratory tract comprising the trachea, bronchi and lungs. The respiratory tract is also connected to the ears via the Eustachian tubes and thus conditions that affect the respiratory tract can also produce symptoms in the ear.

The symptoms that manifest in the respiratory tract can often occur in a number of different

conditions/disease states and it is important to view the complete symptom picture that is presented; for example, viral infections are a common cause of both colds and sore throats and both can occur at the same time. A runny nose can be caused by a cold but also occurs in hay fever. Similarly, a cough can be caused by a cold but can also be a symptom of asthma.

Sneezing, congestion, rhinorrhoea, fever

Before reading further, consider the following case and note your initial thoughts.



Case study

A fit 25-year-old man comes into the pharmacy. ‘Nothing serious’, he explains, ‘certainly nothing to keep me off work.’ He describes experiencing sneezing, nasal congestion and a runny nose. He also complains of a little wheeze on exertion and a fever. But he feels that it is nothing to worry his doctor about.

Trigger questions

- What additional information would you need before considering the appropriate management options in this case?
- What issues concern you about this case?
- Are any alarm symptoms being exhibited that require more urgent treatment or referral?

Assessing symptoms

Sneezing

Sneezing is an expulsion of air from the lungs through the nose and mouth, usually in response to irritation of the nasal mucosa by foreign particles. It can be a feature of the common cold and of hay fever.

The common cold is caused by infection with rhinoviruses, the majority of them belonging to a group called the picornaviruses. The common cold

is highly infectious and spread by close personal contact and by nasal droplets produced by sneezing.

The influenza virus is also spread by close personal contact and sneezing but produces a much more serious and potentially life-threatening condition in some at-risk groups, e.g. in the elderly, those with respiratory conditions, and those with chronic diseases. There are two main forms of the influenza virus, influenza A and influenza B, but both belong to the orthomyxovirus group (see Table 3.1).

The common cold produces a mildly systemic upset characterised by tiredness, slight pyrexia, malaise, sore nose and a watery nasal discharge. Influenza, however, causes a fever, shivering and generalised aching in the limbs that usually starts abruptly.

If nasal symptoms are the result of the common cold then they would be expected to last for only a few days and not longer than 2 weeks. If sneezing has lasted for this duration, it should be re-assessed bearing in mind the possibility of hay fever.

Hay fever is better described as seasonal allergic rhinitis and is defined by the presence of sneezing attacks and nasal discharge or blockage for more than an hour on most days. If this occurs for a limited period of the year it is described as seasonal; however, if it is present throughout the year it is described as perennial. Nasal irritation, sneezing and watery rhinorrhoea are the most troublesome symptoms.

In allergic rhinitis, sneezing is likely to be paroxysmal (occurring as a bout or fit of repetitive sneezing) and accompanied by itchiness in the nose and/or palate, which some sufferers experience before the onset of nasal symptoms. It is also useful to consider the existence of a family or personal history of asthma and/or eczema, which raises the suspicion of allergy. Considering the presence or absence of these

Table 3.1 Forms of influenza virus

Form	Description
Influenza A	Causes worldwide pandemics and has capacity to develop new antigenic variants
Influenza B	Is associated with localised outbreaks of a milder nature

Table 3.2 Classification of allergic rhinitis

Classification	Definition
Intermittent	Symptoms occur at the same time each year. When seasonal allergic rhinitis is caused by grass and tree pollen allergens, it is also known as hay fever. It lasts for less than 4 weeks or less than 4 days per week, although because of multisensitisation hay fever sufferers may have a longer season.
Perennial	Symptoms last more than 4 weeks or more than 4 days per week, typically because of allergens from house dust mites and pets. There is sensitivity to various components in the atmosphere, such as pollen, mould spores, dust and pollutants.
Occupational	Symptoms are due to exposure to allergens at work, for example, flour allergy in a baker.

symptoms will help to distinguish an allergic cause from a viral infection.

In the summer months in the United Kingdom, allergic rhinitis is most likely to be caused by pollen allergy. In the UK 90% of ‘hay fever’ sufferers are allergic to grass pollen (most prolific from May to July) and 25% have an allergy to tree pollen (March to May). At other times of the year allergy may be due to hypersensitivity to antigens found in dust, the spores of some fungi (late summer to early autumn), animal dander, feathers and other materials in the home or workplace. This type of allergy may persist throughout the year and is termed perennial rhinitis, producing symptoms either continuously or in irregular episodes when the allergen in the atmosphere is particularly high. Table 3.2 describes a historical classification of allergic rhinitis; more recently allergic rhinitis has been classified by severity and persistence of symptoms. Such classifications, although reported in the literature, are limited in their usefulness in determining an appropriate treatment for an individual.

Nasal congestion

Nasal congestion is caused by an inflammatory reaction in the lining of the nose, causing dilatation and engorgement of blood vessels and oedema of the mucous membrane. Nasal congestion is the most unpleasant and inconvenient symptom of the

common cold but it can be caused by some drugs, in particular antihypertensive agents, that inhibit the sympathetic nervous system (e.g. alpha- and beta-blocking drugs) and oral contraceptives. Excess mucus may or may not be a feature of nasal congestion but if it is present and is clear and watery this may indicate allergic rhinitis, although this may also be the case with the common cold, at least initially.

Rhinorrhoea (runny nose)

Rhinorrhoea is a discharge from the nasal mucous membrane. Mucus is produced by the membrane as a protective measure of the airways and its production may be increased as a defensive mechanism to protect the nasal cavity and airways. Rhinorrhoea can often accompany nasal congestion as the dilatation and engorgement of blood vessels that occur in nasal congestion stimulate the mucus-secreting glands in the mucosa. Rhinorrhoea can be a symptom of allergic rhinitis and the common cold. In allergic rhinitis the mucus will probably be clear and watery; this may also be the case, at least initially, in someone suffering from the common cold, although the mucus can be thicker and yellowish green in the common cold. However, excess mucus, particularly if it is purulent, would be suggestive of a possible bacterial infection.

Fever

Fever is when the body temperature is raised above the normal temperature of 37°C. A fever in adults with headache, especially with aching muscles, aching joints and/or general malaise, is common in viral infections and sometimes accompanies other symptoms of upper respiratory tract infection. A raised temperature may be a common accompaniment to a viral or bacterial throat infection and as such is of no great significance. However, someone with a persistent sore throat who complains of heavy sweats at night should be advised to see a doctor for a check-up, especially if the lymph nodes in the neck are enlarged, as in rare cases this might reflect a neoplastic disease such as lymphoma. A high temperature in children raises the rare possibility of a convulsion and so should be treated. It is a sudden rise in temperature rather than a persistently elevated temperature that is thought to cause these convulsions.

Accompanying symptoms

Often nasal symptoms can be accompanied by a host of other symptoms such as shivering, sweating, headaches, sore throat and sometimes earache, the latter especially in children. Other symptoms also include those detailed below.

Conjunctivitis (red eye)

Conjunctivitis is an inflammation of the anterior eye and is a common cause of red eye. It may be a sign of a common viral infection such as the common cold as it is possible for infections of the nasal mucosa to extend through the nasolacrimal duct to the conjunctiva of the eye. But red eyes are probably better known as an accompaniment to allergic rhinitis. In allergic rhinitis the eyes usually itch and the sufferer will rub them, whereas in the common cold this is not a predominant feature. Eye conditions are considered in more depth in Chapter 7.

Myalgia

Myalgia (aching muscles and joints) can commonly accompany a viral respiratory infection, when the diagnosis is often known as flu or influenza and unless persistent it is of no consequence provided the sufferer feels relatively well. Influenza is a viral infection that produces upper and sometimes also lower respiratory symptoms accompanied by systemic symptoms such as malaise, myalgia and fever. True influenza can only be diagnosed during epidemics, and confirmation of an epidemic is given by public health teams. In the absence of this official label, the majority of such cases are labelled 'flu-like'. The distinction clinically can be less clear. At-risk groups, such as the elderly and those with chronic diseases, especially respiratory conditions but also cardiovascular disease and diabetes, should be advised to inquire from their local medical practice about their suitability for vaccination against influenza.

Sinusitis

Sinusitis is an infection of the paranasal sinuses (Figure 3.1) that is most commonly associated with upper respiratory tract infection. *Streptococcus pneumoniae* and *Haemophilus influenzae* are the main causative organisms of sinusitis, although

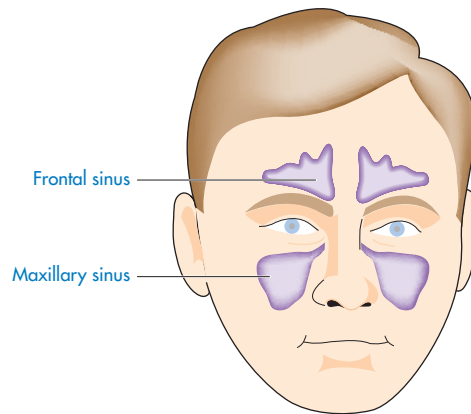


Figure 3.1 Position of the frontal and maxillary sinuses.

occasionally a fungal infection can also be the cause. Sufferers experience tender sinuses and headache (which may be unilateral or bilateral) and this can be accompanied by the common cold and nasal congestion. A green, purulent nasal discharge may also be a feature. The skin over the sinuses (around the orbit of the eye) is sensitive to pressure applied by the fingers.

In most cases sinusitis can be managed by providing symptomatic relief such as simple analgesia with paracetamol or ibuprofen and/or a nasal decongestant. Antibiotics are not normally required as sinusitis is usually caused by a virus. It is important that the sufferer understands that it can take around 2½ weeks for symptoms to resolve, which is longer than for the common cold.

Management options

The best approach is to provide symptomatic relief for the specific symptoms that have been reported. Traditional advice for the common cold has been to take some aspirin or paracetamol, to keep warm and to drink plenty of fluids; this is generally sound advice. A high fluid intake maintains adequate hydration of the body to counteract excessive fluid loss caused by fever. It also increases hydration of the mucous membranes. Steam inhalation provides local hydration of the tissues of the upper respiratory tract and may work by diluting the secretion of mucus, making it less viscous and tenacious. Although the use of steam inhalation is based on folklore and anecdote, it is harmless and can be safely included in any supportive advice given in

Box 3.1 Allergen avoidance advice

- Stay indoors when the pollen count is high.
- Keep windows closed.
- Avoid parks and fields and obvious areas where pollen count will be high.
- Use sunglasses when going outside.
- Wash hands and face on returning indoors.
- If there is a pet in the house, its fur should be wiped down after it has been outside.
- A filter mask that covers the nose and mouth can be effective, especially if someone's activities cannot be confined indoors.

addition to recommending an appropriate non-prescription medicine. It is important when steam inhalation is recommended that the sufferer is cautioned about the potential for scalding the nasal passages if the water used is too hot; boiling water should not be used.

Some relief of allergic rhinitis can be obtained by allergen avoidance, provided the allergen is known. Box 3.1 describes some measures that can be taken; these are no more than common sense but are worth pointing out to sufferers, who may be too focused on hoping that a medicine is going to provide total relief.

In recent years the UK government has promoted a campaign to encourage members of the public to adopt appropriate hygiene measures. These measures include always carrying a tissue to catch a sneeze or cough, disposing of the tissue as soon as possible, and washing hands as soon as possible after sneezing or coughing. These measures aim to minimise the transmission of the viruses that cause upper respiratory tract infections, particularly during the cold and flu season.

Aromatic inhalations (BNF section 3.8)

Menthol and other oils, such as eucalyptus, are present in many formulations that alleviate the symptoms of the common cold. These include inhalations, pastilles and nasal sprays. As well as having a great

placebo effect, these oils do appear to relieve nasal congestion by a cooling effect on the mucous membranes. They are also useful in the relief of nasal obstruction in acute rhinitis or sinusitis. The use of strong aromatic inhalations in children under the age of 3 months is not advised. These oils should not be used regularly for long periods as they may damage the cilia in the respiratory mucosa.

Antihistamines (BNF section 3.4)

Antihistamines are effective in nasal symptoms because of their intrinsic anticholinergic properties, although there is less evidence to support their use in upper respiratory tract infections in comparison with symptoms of an allergic origin. The drugs suppress the production of mucus in the nasal mucosa and thus give symptomatic relief in rhinorrhoea, as well as reducing the postnasal drip that irritates the pharynx and causes coughing. They also reduce the cholinergic transmission of impulses in the nervous pathway of the cough reflex and thus can act as a cough suppressant. Because of their anticholinergic effects, antihistamines should not be recommended to anyone with narrow-angle glaucoma or prostatism. They can also cause dry mouth, constipation and palpitations, and can interfere with accommodation in the eye.

The first-generation antihistamines such as chlorphenamine, diphenhydramine and promethazine are well known for their sedative and anticholinergic effects, but have been largely superseded by the second-generation drugs such as loratadine, cetirizine and acrivastine, which are less likely to cause sedation. The second-generation antihistamines are more effective in relieving sneezing, itching and rhinorrhoea than nasal congestion.

Nasal sprays and eye drops are available containing azelastine and levocabastine. They have a rapid onset of action compared with oral antihistamines (15 minutes, compared with 1–3 hours). The nasal sprays are effective in relieving nasal itchiness, runny nose and sneezing, but not so effective for nasal congestion. This is because they have some anticholinergic activity and dry up secretions. Nasal decongestants or intranasal steroids can be used with the antihistamine if necessary to relieve congestion. A combination of the antihistamine antazoline and sympathomimetic xylometazoline is available as eye

drops for the relief of itchy, allergic conjunctivitis. Antihistamine eye drops can cause temporary local irritation and this is important advice to impart when supplying these products.

Intranasal steroids (BNF section 12.2.1)

Nasal sprays containing steroids, such as beclometasone, budesonide and fluticasone, are effective in alleviating rhinorrhoea, itchiness and sneezing as well as nasal congestion in allergic rhinitis via a local anti-inflammatory effect. They may take several days to exert maximum effect and should be used regularly as a prophylactic measure. They can be used as combination therapy with an oral or topical antihistamine – the latter used for intermittent flare-ups and the steroid spray for the persistent symptoms. However, they are licensed for supply without a prescription only for the prevention and treatment of allergic rhinitis in adults over 18 years subject to a maximum single and daily dose. The use of higher doses or use in individuals under the age of 18 requires these products to be prescribed and supplied via a prescription.

Sodium cromoglicate (BNF section 12.2.1)

The mast cell stabiliser sodium cromoglicate can be sold to the public as eye drops for the treatment of acute seasonal and perennial allergic conjunctivitis, subject to a maximum pack size. The eye drops require to be administered four times a day and provide relief from the symptoms of allergic conjunctivitis, such as itchy and runny eyes. Mast cell stabilisers prevent the release of histamine from mast cells and therefore should be considered as a prophylactic treatment and will only be effective with continued administration.

Systemic nasal decongestants (BNF section 3.10)

Phenylephrine, ephedrine and pseudoephedrine are the most commonly used oral sympathomimetic agents. Sympathomimetics stimulate alpha-adrenoceptors, causing vasoconstriction in the nasal mucosa, resulting in shrinkage of the inflamed tissue and an increase in the lumen of the nasal passages, facilitating breathing and drainage of mucus. They also possess some beta-agonist activity, which confers some bronchodilator effects and hence they can be found in

combination remedies for coughs and colds, although this beta-activity has the potential to disturb blood glucose control by an anti-insulin effect, and hence they should be used with caution in diabetes. Their use is also cautioned in hypertension, hyperthyroidism, pregnancy and ischaemic heart disease because of their ability to increase blood pressure. Products containing sympathomimetics should be avoided in anyone taking monoamine oxidase inhibitors.

Systemic effects of sympathomimetics can be minimised by using a locally acting formulation such as nasal drops or spray, providing rapid and effective relief from nasal congestion when applied to the nasal membranes. The most commonly used are phenylephrine, which is relatively short acting, and oxymetazone and xylometazone, which are claimed to have duration of action of up to 8 hours. They produce relatively few systemic side effects because the local vasoconstriction reduces drug absorption from the site of application. However, the use of local decongestants is associated with a phenomenon known as rhinitis medicamentosa, which is a rebound effect whereby congestion follows the vasoconstriction. The phenomenon can be avoided by reducing use to no more than 7 days.

Owing to the potential for misuse of these agents, their supply to the public from a pharmacy without a prescription has been limited to a maximum of 720 mg of pseudoephedrine salts. It is also a requirement of this restriction that pseudoephedrine salts and ephedrine base (or salts) cannot be supplied at the same time.

Echinacea

Echinacea has been promoted as a herb that stimulates the immune system and is a popular remedy for treating the common cold. Reports of its effectiveness are largely anecdotal and several clinical trials have shown it to be ineffective, both in reducing the severity of symptoms and in shortening the duration of the cold. For further information on the use of echinacea we refer you to *Herbal Medicines* by Joanne Barnes, Linda A. Anderson and J. David Phillipson (Pharmaceutical Press, 2007).

Table 3.3 describes some important interactions between drugs that are available as non-prescription medicines that are included in various products used to treat the common cold and some prescribed drugs.

Table 3.3 Interactions between non-prescription medicines for colds and prescribed drugs

Non-prescription medicines	Interacting drug	Consequence
Antihistamines	Anxiolytics Hypnotics Sedatives Alcohol	Enhanced sedation and CNS depressant effects
Antihistamines (because of intrinsic anticholinergic properties)	Anticholinergic drugs, including tricyclic antidepressants Phenothiazines	Enhanced anticholinergic effect, e.g. dry mouth, blurred vision, constipation and urinary retention
Sympathomimetics (particularly oral formulations)	Anticholinergic drugs Antihypertensive therapy	Reduced antihypertensive effects
	Monoamine oxidase inhibitors (MAOIs)	Hypertensive crisis
	Tricyclic antidepressants	Hypertension is possible with phenylephrine (less likely with ephedrine and pseudoephedrine)



Re-consider the case

Before reading further, re-consider the following questions and your initial thoughts on this case.

Trigger questions

- What additional information would you need before considering the appropriate management options in this case?
- What issues concern you about this case?
- Are any alarm symptoms being exhibited that require more urgent treatment or referral?

Case study

A fit 25-year-old man comes into the pharmacy. ‘Nothing serious’, he explains, ‘certainly nothing to keep me off work.’ He describes experiencing nasal congestion, a runny nose and sneezing. He also complains of a little wheeze on exertion and a fever. But he feels that it is nothing to worry his doctor about.



Pharmacist opinion

A history of this illness needs to be determined, including its duration, progression and the presence of other features that may not have been revealed. Considering the initial symptoms of nasal congestion, runny nose and sneezing presented in this case, it would be possible to use a combination of an antihistamine and sympathomimetic to treat these symptoms. Based on the information provided, there are no contraindications to the use of any of these products in this case. The use of sympathomimetics is cautioned in diabetes, hypertension and hyperthyroidism. However, the presence of wheeze on exertion and a fever, does suggest that this is not just the common cold. Establishing a medical history for this man would be important to rule out pre-existing asthma, particularly in relation to the wheeze on exertion.

Asthma is characterised by wheezing, caused by bronchoconstriction, hypersecretion of mucus and inflammation of the bronchi, it must be noted that although wheezing is classically present, asthma can sometimes present solely as a cough without wheezing.



Pharmacist opinion (*continued*)

In asthma there is difficulty in breathing, particularly on expiration, such that sufferers feel that they cannot remove all the air from their lungs. Asthma may be caused by allergens (extrinsic asthma) or may show no relation to obvious allergens (intrinsic asthma). It may be triggered by respiratory infection, air pollution, or drugs such as beta-blockers. Acute attacks are sudden in onset, common during the night, and in children may present as a persistent dry cough.

The presence of fever is also of concern and is suggestive of an infectious process. Fever is not uncommon in viral upper respiratory tract infections and therefore it would be important to consider whether there was a medical need for this to be further investigated. It would also be important to establish the absence of any recent foreign travel as this would certainly warrant a further medical investigation of his symptoms.



General practitioner opinion

In dealing with this patient it is helpful to understand why he has come: does he want something to help him feel better, or does he just want some reassurance that it is indeed 'nothing serious'? An initial assessment of systemic symptoms and signs will be very useful. Symptoms such as sweating, rigors, racing heartbeat would suggest this illness is affecting him systemically and may need further investigation. Objective signs of temperature, pulse and respiratory rate would also be helpful. Anyone who cannot speak in full sentences at rest requires immediate medical attention.

His chest symptoms warrant a little exploration. Does he smoke? Does he have a pre-existing respiratory condition, e.g. asthma? Has he been on any recent foreign trips? Wheeze on exertion may be a sign of asthma. This man may already have a diagnosis of asthma, whether current or in childhood. The wheeze could be the first presentation of asthma or a worsening of pre-existing symptoms. The wheeze may be a sign of lung damage caused by smoking and it is worth remembering that some people with asthma do choose to smoke.

There can also be the presence of wheeze during a chest infection; the presence of systemic symptoms and signs would suggest this as a possible cause. Very rarely in adults a wheeze can be a sign of an inhaled foreign body. This is unlikely in this case, but worth consideration.

It may be appropriate to discuss infection control issues if he decides to stay at work. The type of work he does will have a bearing on how appropriate it is for him to continue to work and his employers may have their own policy regarding this.



Summary of key points

Condition	Management
Allergic rhinitis (hay fever) is characterised by an itchy nose, sneezing, rhinorrhoea, nasal congestion, red and itching eyes.	Avoidance of known allergen or measures that reduce exposure to allergen. Antihistamines can be used to provide symptomatic relief. Intranasal steroids and sodium cromoglicate eye drops can be used for prophylaxis of symptoms. Intranasal decongestants can be used if nasal congestion is present.



Summary of key points (continued)

Condition	Management
Sinusitis is characterised by tender sinuses, headache and often accompanied by common cold and nasal congestion.	Symptomatic relief can be provided with oral analgesics such as paracetamol or ibuprofen at an appropriate dose for the sufferer. Nasal decongestants can be useful in relieving the symptoms of sinusitis. Antibiotics are not normally required as sinusitis is usually caused by a virus. Symptoms can take around 2½ weeks to resolve.
Common cold is characterised by nasal symptoms of sneezing, rhinorrhoea, congestion and other symptoms such as sore throat, headache, coughing.	Symptomatic relief can be provided with oral analgesics such as paracetamol or aspirin at an appropriate dose for the sufferer. Systemic or topical decongestants may provide relief if nasal congestion is present. Oral antihistamines may provide relief from rhinorrhoea by drying nasal secretions.
Influenza is characterised by a sudden onset of fever, shivering and generalised aching of the limbs.	Bed rest. Maintain fluid intake. Symptomatic relief can be provided with oral analgesics such as paracetamol or aspirin at an appropriate dose for the sufferer.



When to refer

- Production of purulent mucus for several days
- Sinus or ear pain that does not resolve after 7 days
- Any concurrent illness or history where infection may be a risk, depending on the severity of symptoms, e.g. chronic respiratory conditions, heart failure or immunosuppression
- Suspected influenza infection in at-risk groups such as people with long-term underlying health conditions, e.g. diabetes, asthma, pregnant women, children under 1 year
- Where symptoms do not improve with time or where symptoms get worse

Cough and sore throat

Before reading further, consider the following case and note your initial thoughts.



Case study

One Saturday afternoon a man in his late 20s comes into the pharmacy and asks to speak to the pharmacist. He is smartly and fashionably dressed and is suffering from a sore throat. He has been using regular paracetamol for around 8 days so that he could continue to work. But after a few days a cough developed. It is productive, with some white or yellow phlegm. His past history reveals that he has had throat infections before, and received antibiotics on several occasions from his GP. He believed they worked, as he started improving a few days later. He has contacted his surgery, which offered him a telephone call from a nurse, which he felt inappropriate. He has an important and busy job, and cannot afford any time off work.



Case study (continued)

Trigger questions

- What additional information would you need before considering the appropriate management options in this case?
- What issues concern you about this case?
- Are any alarm symptoms being exhibited that require more urgent treatment or referral?

Assessing symptoms

Sore throat

A sore throat is generally a self-limiting condition, with an estimated 50–80% of sore throats having a viral cause. Sore throats caused by either viral or bacterial infections will usually disappear spontaneously within a few days, and as such they are not serious and do not warrant treatment with antibiotics. Sore throats are often described by the sufferer as painful, and therefore pain alone is not always a cause for referral unless it is persistent and accompanied by other symptoms. A sore throat persisting for more than 1 week requires consideration for referral, and if it is persistent for 2 weeks it should be referred for medical appraisal.

The Centor criteria are a useful tool to help decide on the severity and need for referral for someone presenting with an acute sore throat. The criteria look for the following four clinical signs: presence of tonsillar exudate; presence of tender anterior cervical lymphadenopathy or lymphadenitis; history of fever; and absence of cough. The presence of three or four of these clinical signs may indicate that the individual has a bacterial throat infection and may benefit from antibiotic treatment. Conversely, the absence of three or four of these clinical signs suggests that the individual does not have an infection and therefore that antibiotic treatment is less appropriate.

Examining the back of the throat by getting the patient to open the mouth as wide as possible and then stick out the tongue (a tongue depressor and the light of an auroscope will help greatly with this examination) will reveal on each side of the throat the anterior and posterior pillars of the fauces, between which the tonsils are situated (Figure 3.2).

Tonsillitis (an acute inflammation of the tonsils) can be caused by a bacterial or viral infection and

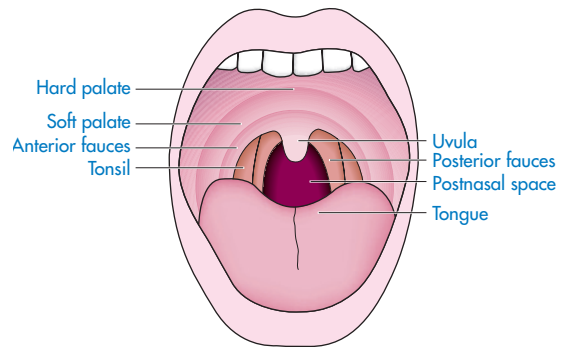


Figure 3.2 Diagram showing the position of the tonsils.

the tonsils will appear red and swollen; they can sometimes also have white flecks of pus (Figure 3.3). This can result in difficulty in swallowing and cause the lymph glands of the neck to become tender and enlarged.

Tonsillitis is generally self-limiting, but if there is no improvement after 3 days then the sufferer should be referred as it may be necessary to differentiate between tonsillitis and a streptococcal infection,



Figure 3.3 White spots of pus on enlarged tonsils.

(Reproduced with permission from Dr P. Marazzi/Science Photo Library, SPL M270.063).

which may require antibiotic therapy, as both conditions have a very similar presentation.

Quinsy (an abscess on the tonsils), may develop about 1 week after the onset of tonsillitis. The sufferer has a painful throat that may spread to the ear, feels ill, has difficulty in swallowing and experiences some obstruction to breathing. This is a rare condition and requires referral. Referral would also be appropriate if the lymph nodes in the neck (Figure 3.4) appear swollen, are tender and are extraordinarily painful or do not improve after 5–7 days, as antibiotic therapy may need to be considered.

The presence of enlarged, tender lymph nodes in the neck or elsewhere, in a teenager or young adult complaining of a persistent severe sore throat might suggest a diagnosis of glandular fever (infectious mononucleosis), particularly if they also feel ill and weak. The condition follows a series of attacks, with each attack becoming milder than the last. The first attack will resolve in 2–4 weeks but each subsequent attack occurs after a longer time. This process can take several months, rarely up to 2 years, and the fatigue persists between attacks. The diagnosis can be confirmed by a blood test and therefore would require referral for medical opinion.

Recurrent sore throats should be seen as a potential sign of various, but rare, causes such as immunosuppression caused by drugs or other conditions such as HIV (human immune deficiency virus) infection and AIDS (acquired immune deficiency syndrome). The drugs listed in Box 3.2 have the potential to cause bone marrow suppression, resulting in a deficiency of white blood cells and repeated infections of the throat and other organs. Ulcers or small petechial haemorrhages (purple or red spots)

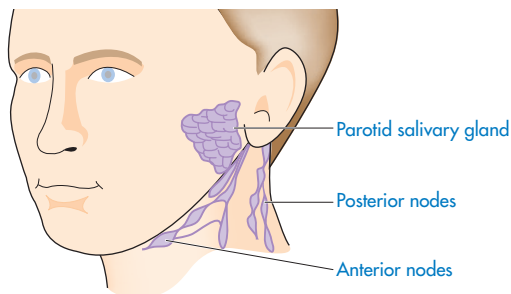


Figure 3.4 Main group of lymph nodes in the neck.

Box 3.2 Drugs with potential to cause immunosuppression

- Carbimazole
- Cytotoxics
- Gold salts
- Tolbutamide
- Chlorpropamide
- Phenothiazines
- Antimalarials
- Some antibiotics

on the palate or the mucosa of the mouth, or ulcers and blistering on the lips and inside the mouth are common symptoms of drug-induced bone marrow suppression, a situation that requires urgent referral for medical opinion as the consequences of a lowered white cell count can be extremely serious.

Sore throat caused by drug deposition during inhalation of steroids can be reduced by advising rinsing of the mouth with water after use of a steroid inhaler. People with undiagnosed or poorly controlled diabetes are susceptible to throat infections, especially those caused by fungi and yeasts, such as *Candida* (thrush). Oral thrush may be recognised by the appearance of white spots on the buccal mucosa and soft palate.

Cough

The cough reflex is a protective mechanism that is stimulated by irritation of the respiratory mucosa in the lungs, the trachea or the pharynx. The reflex has three nervous components: (a) receptors in the mucosa of the respiratory tract are sensitive to chemical or mechanical stimulation and activate the discharge of afferent impulses along cholinergic (vagus) nerve fibres to (b) the cough centre in the brain stem; (c) efferent impulses from the cough centre are then transmitted along cholinergic nerves. This causes contraction of the diaphragm, abdominal and intercostal muscles, resulting in a rapid expulsion of air from the lungs, taking with it mucus and irritating particles on the surface of the respiratory mucosa. It is often a reaction to infection or contamination of the respiratory tract and is a protective mechanism to clear the airways of contaminants.

It may sometimes be desirable to encourage a cough and sometimes to suppress it, and in many

Table 3.4 Comparison of non-productive and productive cough

Non-productive cough	Productive cough
<ul style="list-style-type: none"> No sputum production. Dry tickling sensation, irritating not only to sufferer but to those who work and live with them. Typical response to damage to the upper respiratory tract epithelium caused by: <ul style="list-style-type: none"> viral infection smoking (active and passive) a dry atmosphere air pollution a change in temperature. May also be a feature of some serious conditions such as asthma or lung cancer, or an adverse reaction to drugs, e.g. ACE inhibitors. Wait for 4 weeks before referring anyone who is taking an ACE inhibitor to a doctor to try and differentiate the cause of the cough. 	<ul style="list-style-type: none"> Sputum production, helpful in eliciting the severity of any underlying cause. In some circumstances sufferers will deny bringing up any sputum, although they will say that they can feel phlegm on their chest. In such cases, the cough is best regarded as productive rather than non-productive.

cases interference with it may delay its disappearance or exacerbate the underlying disturbance that caused it. The most frequent cause of a cough in the developed world is an upper respiratory tract infection such as the common cold, but other common causes include allergies and exacerbations of chronic obstructive pulmonary disease.

A cough may be broadly described as either productive – i.e. producing sputum – or non-productive (dry), with no sputum, so obtaining an accurate history and description of the cough is critical to choosing the most appropriate management option. Sputum occurs when excess mucus is produced in the respiratory tract; the most common cause of excess

mucus production is cigarette smoking. The production of sputum is a feature of chronic bronchitis and the classic definition of chronic bronchitis is the production of sputum on most days over at least 3 months for two consecutive years. This causes damage to the lungs and the development of permanent symptoms, such as breathing difficulties, wheezing and shortness of breath. Table 3.4 provides a comparison of the features of productive and non-productive cough.

Doctors often inquire about the colour of expectorated sputum and, although a crude judgement, it is still a useful observation to assist decision making in determining an appropriate course of action (Table 3.5).

Table 3.5 Types of sputum production

Type	Description
Clear or white	Generally considered as being of little significance, unless produced in copious amounts.
Thick yellow, green or brown, or foul-smelling	Suggests a lower respiratory (i.e. lung) infection, such as bronchitis, but this is not always the case and sometimes may just represent cell debris being cleared from the airways.
Clear, straw-coloured	Seen in disorders of allergic origin, such as some forms of asthma, the yellow tinge being caused by the presence of large quantities of eosinophils from the blood as part of the allergic response.
Blood in the sputum (haemoptysis)	Seen as either copious fresh blood, spots or streaks, which may sometimes colour the sputum brown. It should be regarded with suspicion and referral for further investigation is suggested, as it may be a sign of pulmonary embolism, tuberculosis, bronchitis or lung cancer. Check that the blood does appear to be coming from the lung and not from the mouth, throat or nose (caused by trauma, such as nose blowing).
Pink and frothy	Seen in heart failure, where there is congestion of blood in the lungs and some leakage of plasma into the air spaces. Pneumonia typically produces rust-coloured sputum at first, which may progress to being bloodstained.

Table 3.6 Duration and frequency of coughs

Acute	Subacute	Chronic
<ul style="list-style-type: none"> • Duration less than 3 weeks. • Usually self-limiting. • Most common cause is viral infections of the upper respiratory tract. • Medical opinion should be considered if there is no improvement in cough after 2–3 weeks. 	<ul style="list-style-type: none"> • Duration 3–8 weeks. • A cough that started as a common cold but has persisted longer than 3 weeks is most likely due to persistent postnasal drip, which is self-limiting, bacterial sinusitis or asthma. 	<ul style="list-style-type: none"> • Duration lasting more than 8 weeks. • A long-standing or recurrent cough, especially in those over the age of 40 years, may be a sign of more sinister disease such as lung cancer. • Persistent cough may also be an adverse effect of some drugs. • Chronic coughs are best referred, as they may be due to chronic lung disease. • Recurrent coughs may indicate a serious problem requiring referral. For instance, in chronic bronchitis a persistent cough is present for more than 3 months in the year, and in bronchiectasis recurrent chest infections occur that require treatment with antibiotics. • Cigarette smokers often have a recurrent cough, which may be due to chronic bronchitis, and they should be examined by their doctor to exclude infection or lung damage.

Obviously, at first appearance all coughs will be acute (Table 3.6), but sufferers will seek advice at different times after onset, and this makes it possible to decide whether self-treatment or referral is more appropriate. Although uncommon, gastro-oesophageal reflux disease (GORD) can be a cause of chronic cough and may present with a cough alone or together with heartburn, oesophageal reflux and oral regurgitation. It is usually diagnosed by various tests and a trial with antacid therapy such as a proton pump inhibitor.

Accompanying symptoms

Difficulty in swallowing (dysphagia)

Anyone with a sore throat will find it less easy than normal to swallow, but if there is more than the expected degree of difficulty then a referral should be considered. In children and teenagers with throat infections, especially tonsillitis, a sensation may develop of the throat ‘closing over’. This is usually more apparent than real, but if drinking becomes very difficult or saliva cannot be swallowed, referral is advised. In extreme cases, such as quinsy, where there is an abscess on the tonsils, inflammation at the back of the throat may be so severe as potentially to restrict breathing.

In very rare cases, dysphagia may be related to an obstruction in the throat or a tumour pressing on the oesophagus. It should be remembered that the reason for asking about difficulty in swallowing is to exclude those rare, severe cases where either the pharynx is dangerously inflamed or there is additional pathology causing obstruction that requires a medical opinion. It is often difficult to distinguish between a genuine difficulty in swallowing (dysphagia) and pain on swallowing. The latter can be expected with a sore throat and will be commonly complained of. A pertinent question to ask is whether the sufferer can swallow liquids. If the answer is negative, then an urgent referral for medical investigation should definitely be made.

Hoarseness

Some degree of hoarseness is to be expected with a sore throat, particularly when the larynx is involved. Inflammation of the larynx or laryngitis is characterised by hoarseness and can be a complication of an upper respiratory infection, such as a cold or sore throat, or due to the inhalation of irritants such as tobacco smoke. Hoarseness that does not resolve within 5 days requires a medical opinion regarding the value of starting antibiotics. Persistent and unusually severe hoarseness accompanied by

difficulty in swallowing should also be referred for a medical opinion to allow more sinister but rarer causes such as laryngeal or pharyngeal tumours to be excluded.

Earache

Infection in the pharynx can easily spread to the ear via the Eustachian tube. Earache should be referred if it has not improved after 72 hours or if there is a discharge, as it is not only unpleasant but may be caused by bacterial infection, which should be assessed for suitability for treatment with antibiotics.

Skin rash

A sore throat and a skin rash occurring together may reflect a reaction to a drug, and if this is suspected referral for medical investigation and appraisal is necessary. A florid, itching rash all over the body can develop either during or shortly after finishing a course of ampicillin or amoxicillin in someone who has glandular fever (infectious mononucleosis). Therefore, phenoxymethylpenicillin should normally be the antibiotic of choice for streptococcal sore throats.

Nasal congestion, sore throat, fever, myalgia, malaise

Cough is commonly associated with or preceded by symptoms of the common cold or influenza-like illnesses such as nasal congestion. In such cases it is invariably nothing more than a simple viral infection, which may be treated symptomatically with non-prescription drugs. If symptoms of a cold are either already present or developing, it is likely that the sore throat is part of the cold syndrome, caused by a viral infection. Viral infections cause sufferers to feel ill and run down, but if there is severe malaise, particularly in the presence of other symptoms, then they should be referred for medical investigation without delay. Fever and sweating in someone with a cough suggests infection.

Shortness of breath, difficulty in breathing (dyspnoea), chest pain

These symptoms should be viewed as alarm symptoms that require further, urgent medical investigation. Such symptoms may be progressive over a number of months or years, indicating chronic bronchitis, emphysema, heart failure or other serious

diseases, or they may be recurrent, as in asthma, when the characteristic wheeze may be heard.

The lung tissue itself has no sensory pain fibres. Pain felt in the chest caused by respiratory disease can arise from the pleura, trachea, bronchi, or the vascular supply. Such pain always requires immediate medical referral. Pain felt on deep inspiration or coughing may be caused by pleurisy or pulmonary embolism.

The lung is normally held against the thoracic wall by a relative negative pressure in the pleural space that 'sucks' it out to assume the shape of the thoracic cavity. If the pleural envelope is ruptured, air enters into the pleural cavity, neutralising the negative pressure, and as a result the lung collapses. This is a pneumothorax. It occurs without warning and for no apparent reason, particularly in healthy young men, as well as in bronchitis or emphysema. It gives rise to a severe, unilateral chest pain which may be either constant or pleuritic in nature, and there may be some dyspnoea. The pain may be felt over the shoulder or sternum and may resemble that of angina or myocardial infarction.

Pulmonary embolism is caused by a thrombus that has formed elsewhere and has detached itself from its primary site, such as a deep vein in the calf of the leg; where this is the case, it is likely that there will be pain in the calf muscle along with swelling in the calf or the ankle. Once detached, the thrombus is carried by the circulation to the lung, where it lodges in the pulmonary artery. The arterial lumen is then blocked, causing lung tissue supplied by the artery to die (pulmonary infarct). Chest pain associated with a pulmonary embolism will usually be of sudden onset and accompanied with some dyspnoea. Cough will be a minor feature of this picture, but these symptoms could also be produced by intercostal muscle strain following a coughing bout.

Weight loss

An unintended dramatic loss of weight suggests the possibility of serious disease and therefore medical referral would be appropriate. In considering the respiratory system, two conditions that need to be considered are tuberculosis and lung cancer.

Tuberculosis is a disease of slow onset and in its early stages the symptoms are often mild. It is common in developing countries but does also occur in the UK. It is often overlooked in the elderly

because of its insidious onset and its resemblance to bronchitis and congestive heart failure. Symptoms include a persistent cough, blood in the sputum (not always), fever or night sweats and weight loss. People at risk include the elderly, those who have contact with known cases, immigrants and alcoholics.

Lung cancer is more common in men than women, is seen more often in cigarette smokers, and usually appears between the ages of 50 and 70 years. These characteristics need to be considered when considering the cause of a cough. A cough may have been present for some time in smokers, but any change in its character is a signal to refer for further medical investigation.

Management options

Like any other ‘trivial’ symptom, a cough with no serious underlying cause will be self-limiting and will disappear spontaneously within a few days. However, public expectations are high, and members of the public will still seek a ‘cough bottle’ even if the evidence suggests that it is little more than a placebo. A number of Cochrane reviews have shown insufficient evidence for or against the use of various preparations in the management of cough, although clinical studies have shown that some people will find a cough remedy helpful even if the actual clinical benefit may be questionable. Given the self-limiting nature of a cough with no serious underlying cause, it will remain difficult to establish an evidence base.

This still allows the option of a ‘cough bottle’ to be recommended if the sufferer wants to try it. Thus a form of words can be constructed that will acknowledge the awareness of the negative evidence base while not discouraging people who might want to try a cough medicine. This in turn should encourage a dialogue between the health professional and the sufferer, allowing the individual to retain some choice in managing their symptoms.

It should be borne in mind that many cough preparations do contain drugs with recognised pharmacological activity, even if the clinical significance is unproven. It is pertinent, therefore, that some logical rationale is considered when choosing a product containing a mixture of drugs to give symptomatic relief. Table 3.7 summarises some rational combinations.

Table 3.7 Examples of pharmacologically rational cough mixtures marketed in the UK

Suppressant	Bronchodilator/ decongestant	Antihistamine
Dextromethorphan		Triprolidine
Dextromethorphan	Ephedrine	
Dextromethorphan	Pseudoephedrine	Diphenhydramine
Dextromethorphan	Pseudoephedrine	Triprolidine
Codeine	Pseudoephedrine	Diphenhydramine

Historically there have been some irrational combinations available in the UK. For example, combinations of expectorants and cough suppressants, or expectorants and antihistamines, are irrational. If a cough is productive and requires an expectorant, then it should not be suppressed at the same time. Similarly, antihistamine drugs will reduce bronchial secretions by an anticholinergic mechanism and this is pharmacologically antagonistic to the effect of an expectorant. Some combinations are entirely logical. For example, a mixture of a bronchodilator and an expectorant, or a bronchodilator and a cough suppressant/antihistamine does not present any obvious pharmacological antagonism.

In April 2009 following a review by the Medicines and Healthcare products Regulatory Agency (MHRA), the Commission on Human Medicines (CHM) advised that cough and cold remedies containing antitussives, expectorants, nasal decongestants and antihistamines no longer be used for the treatment of coughs and colds in children less than 6 years old. This recommendation reflected the lack of robust evidence that cough and cold remedies containing these ingredients are effective and that some reports of harm with these ingredients have been received. Therefore, the decision was made that the risks of such products in this age group outweigh the benefits given the increased incidence of coughs and colds in children under the age of 6.

Lozenges and sprays (BNF section 12.3)

Lozenges have a traditional place in the treatment of sore throats. However, the clinical benefit of the

antibacterial agents they contain is tenuous, especially given that around 50–80% of sore throats are viral in nature. These agents include dequalinium, tyrothricin, hexylresorcinol, amylmetacresol, benzalkonium and cetylpyridinium. Probably the most useful effect of the majority of lozenges lies in their ability to stimulate the flow of saliva, which acts as a demulcent and soothes the pharynx. Some lozenges contain a local anaesthetic such as benzocaine or lignocaine, but the amount is probably too small to offer any real benefit. These two local anaesthetics are also available in a spray preparation.

Lozenges containing the non-steroidal anti-inflammatory drug (NSAID) flurbiprofen give another dimension to the treatment of sore throats. Flurbiprofen has anti-inflammatory and analgesic properties that offer promising therapeutic potential and another option to sufferers. However, this promise has not been substantiated by any good evidence, as clinical trials have only been carried out against placebo. Nevertheless, trials have shown flurbiprofen to be better than placebo. The duration of flurbiprofen use is restricted to 3 days, and it is contraindicated in children under 12 years, in anyone already taking NSAIDs, in those with a history of asthma or peptic ulcer disease, and in those with a known allergy to aspirin or other NSAIDs.

If aspirin or NSAIDs are not contraindicated, another approach to the treatment of a painful throat is to dissolve one or two soluble aspirins and use the solution as a gargle. The effect is essentially the same as using flurbiprofen lozenges.

Cough suppressants (antitussives) **(BNF section 3.9.1)**

Cough suppressants can usefully provide symptomatic relief of a dry, irritating or tickly cough that produces little or no sputum. Care should be taken in recommending a cough suppressant if chronic obstructive pulmonary disease is present, as the cough reflex is essential to clear the airways of mucus.

Centrally acting cough suppressants act on the cough centre in the brain and reduce the discharge of impulses down the efferent nerves to the muscles that produce coughing. Examples are codeine, pholcodine and dextromethorphan. All are capable of

causing sedation (though allegedly less so with dextromethorphan), and long courses will give rise to constipation and may produce dependence. Thus, only short courses should be recommended.

Pholcodine and dextromethorphan reputedly have fewer adverse effects and less abuse potential than codeine, although this is unlikely to be of clinical significance in normal, short-term use.

In October 2010 an MHRA Public Assessment Report concluded that there was a lack of robust evidence for the efficacy of codeine in suppressing a cough in a child and the risks associated with the use of liquid codeine medicines for the suppression of a cough in children and young people under the age of 18 outweighed the benefits. Therefore, oral liquid medicines containing codeine should not be used to treat cough in children or young people less than 18 years of age.

Expectorants (BNF section 3.9.2)

Expectorants have traditionally been used to increase bronchial secretions and thus reduce the tenacity of mucus, which can then be coughed up. They have a place in cough therapy, but their efficacy is controversial owing to the lack of strong supportive, objective data, although there is considerable subjective support for their use. Plugs of mucus and debris in the small airways can cause breathing difficulties and act as sites of infection, and sufferers who attempt to remove sputum they can ‘feel’ in their chests may become exhausted by coughing if the mucus is so viscous that it adheres to the mucosal lining of the lungs. There are therefore good reasons for trying to facilitate expectoration.

Hydration of the airways will facilitate adequate production of non-viscous mucus from the glands lining the lungs. This can be simply and effectively achieved by drinking plenty of fluid, so that the tissues remain hydrated, as well as by humidifying the inspired air with steam inhalations. The addition of substances such as menthol or compound tincture of benzoin (Friar’s balsam) to the hot water providing the steam is probably of no extra value except for a psychological effect (which should not be undervalued). One theory of how expectorants have their effect is by irritating the gastric mucosa. This produces a reflex stimulation of the bronchial tree, which responds by secreting more mucus.

Various ammonium salts have been used over the years and the chloride is still used, albeit less commonly than previously. Guaifenesin is present in many proprietary cough medicines, although the dosage varies considerably. It would be logical to recommend doses of 100–200 mg for maximum effect. Ipecacuanha at subemetic doses stimulates the gastric mucosa and is used as an expectorant. Citric acid and sodium citrate have expectorant properties, but in the doses used these are probably weak. Squill is an old-established medicine that may be found in some proprietary cough remedies. Liquid extracts of liquorice, capsicum, terpin, menthol and eucalyptus oil also appear in proprietary cough medicines.

Demulcents (BNF section 3.9.2)

Demulcents, such as honey, glycerin (glycerol) and syrup, are said to act by coating the pharyngeal

mucosa, which may be inflamed, and offer some protection from irritants such as smoke or dust particles. Their efficacy probably relates largely to a soothing placebo effect, but the demulcent effect on the mucosa may be a real one and may also serve to hydrate the delicate mucosal tissues. Where postnasal drip occurs, demulcents may reduce irritation of the pharyngeal mucosa.

Demulcents are now the only option (alongside paracetamol for symptomatic relief) for the management of coughs and colds in children under the age of 6 years as antitussives, expectorants and decongestants are no longer licensed for this age group. Demulcents also remain useful for pregnant women, where again the combination of a self-limiting condition and lack of robust evidence of the efficacy of cough medicines makes the use of demulcents the safer option.



Re-consider the case

Before reading further, re-consider the following questions and your initial thoughts on this case.

Trigger questions

- What additional information would you need before considering the appropriate management options in this case?
- What issues concern you about this case?
- Are any alarm symptoms being exhibited that require more urgent treatment or referral?

Case study

One Saturday afternoon a man in his late 20s comes into the pharmacy and asks to speak to the pharmacist. He is smartly and fashionably dressed and is suffering from a sore throat. He has been using paracetamol regularly for around 8 days so that he could continue to work. But after a few days a cough developed. It is productive, with some white or yellow phlegm. His past history reveals that he has had throat infections before, and received antibiotics on several occasions from his GP. He believed they worked, as he started improving a few days later. He has contacted his surgery, which offered him a telephone call from a nurse, which he felt inappropriate. He has an important and busy job, and cannot afford any time off work.



Pharmacist opinion

Age is an important consideration in this case, as a persistent or recurrent sore throat in teenagers and young adults requires referral to exclude glandular fever. Age is also important when considering the development of the cough as a cough in a child needs to be considered carefully and a full history taken as a persistent irritant cough can indicate asthma in a child.



Pharmacist opinion (*continued*)

Cough is also a feature of croup and whooping cough (pertussis), both of which occur in children. The term ‘croup’ is used loosely by both medical and non-medical people to encompass a variety of symptoms associated with an irritant cough in children. Properly used, the term describes an infection (usually viral) of the larynx and trachea that leads to oedema and narrowing of the airway. There is a severe and violent cough, which is often paroxysmal (occurring in bouts) and the child often has difficulty in breathing between bouts, as well as exhibiting stridor (noisy inspiration).

Whooping cough, although now rare because of immunisation programmes, does still occur in children, usually those under 5 years of age. The condition may present initially as a cold, and after a few days a cough develops, occurring at around hourly intervals. After about a week a whoop is heard on inspiration following a spasm of explosive coughing. The cough produces a plug of thick sputum, and is accompanied sometimes by vomiting. The whoop may last for several weeks or months. In both situations referral for medical appraisal is necessary.

This man does not present any obvious alarm symptoms and although he reports a productive cough, the nature of the phlegm described is not an immediate cause for concern, especially considering the absence of any other alarm symptoms such as unintentional weight loss, dysphagia, or swollen cervical lymph nodes. If the man has an expectation that he needs antibiotic treatment then clearly he does need either to speak with his GP or accept the offer of a telephone call from the nurse as these do need to be supplied via a prescription. There is a general misconception within the general population that antibiotics are needed for sore throats, but considering that around 50–80% of sore throats have a viral cause and are self-limiting, the use of antibiotics is generally inappropriate unless a bacterial cause is established. In this case, advising on self-care and the use of analgesia whether oral or topical would be an appropriate course of action to adopt assuming that there were no reasons for referral.



General practitioner opinion

This man has some preconceptions regarding antibiotics and has already had contact with another health professional. It is important to bear in mind that there are associated emotions related to this man’s symptoms; the initial focus on physical symptoms should direct discussion.

The aim here is to work out whether these symptoms are caused by viral or bacterial infection. He has continued to work and it would be helpful to know what kind of work he has been able to do while unwell. Has he had high temperatures associated with his symptoms? Has he been able to swallow fluids and solids? His temperature could be taken in the pharmacy. Does he look unwell? Is he sweating? Is there evidence of swollen lymph glands? Cervical lymph nodes run down the neck on both sides from the angle of the jaw. Using a pen torch to examine the back of the throat may reveal mild inflammation of the pharynx (a little red) or moderate inflammation with swollen tonsils.

Symptoms and signs to support a bacterial infection would be persistent high temperatures, inability to concentrate at work – particularly inability to do manual work – presence of tender swollen lymph nodes and moderate to severe inflammation of the pharynx.

The history in this case implies that this is a viral throat infection. Negative findings on examination would support this conclusion. He now needs gentle handling of his preconceptions. People normally appreciate thorough questioning and examination, so he should be appreciative of the time already spent with him. He should now be receptive to a clear explanation of the nature of viral throat



General practitioner opinion (*continued*)

infection. He should understand that the condition is self-limiting and will not respond to antibiotics. Advice regarding supportive treatment including use of paracetamol and/or NSAIDs should be given. This could be supported by printed information.



Summary of key points

Condition	Management
Cough can be characterised as productive or non-productive and acute, subacute or chronic.	Depends on type and duration of cough but consider expectorants, cough suppressants and demulcents. Demulcents are the only option for children under 6 years.
Sore throat is usually self-limiting and can be seen alongside coughs and colds.	Consider the use of oral analgesics, throat lozenges and sprays.
Tonsillitis is characterised by red and swollen tonsils with or without flecks of white pus.	Oral analgesics, throat lozenges and sprays can be advised in the short-term. Refer for medical appraisal if there is no improvement after 3 days, as antibiotic treatment may need to be considered.
Whooping cough is characterised by malaise, anorexia, mucoid rhinorrhoea and conjunctivitis followed by paroxysms of cough.	Requires referral.
Croup is characterised by an irritant cough in children that occurs in bouts.	Requires referral because a child can sometimes experience difficulty in breathing between bouts of coughing.



When to refer

If presenting with a sore throat:

- Individuals who are immunosuppressed or taking medication such as carbimazole, phenothiazines, antibiotics, cytotoxic drugs, gold, chlorpropamide or steroids
- Accompanied by a skin rash
- History of endocarditis, rheumatic fever or artificial heart valves
- Accompanied by painful enlarged lymph glands in the neck, or enlarged glands that do not improve within 5–7 days
- Long-term or recurrent hoarseness or loss of voice
- Earache that does not resolve after 72 hours or is accompanied by a discharge
- Difficulty in swallowing
- Recurrent tonsillitis in children

If presenting with a cough/cold:

- Difficulty in breathing, wheezing (especially in young children), breathlessness
- Malaise in teenagers and young adults for more than 7 days
- Severe symptoms that do not improve within 7 days
- Dry night-time cough in children



When to refer (*continued*)

- Any concurrent illness or history where infection may be a risk, depending on the severity of symptoms, e.g. chronic respiratory conditions, heart failure or immunosuppression
- Recurrent cough or constant smoker's cough, except where the doctor has given specific guidance for action at a previous consultation
- Chest pain, either unilateral or bilateral, particularly if exacerbated on coughing or deep inspiration
- Sputum is bloodstained or purulent, i.e. unusual colour (green, brown) or foul smelling*
- Concurrent medication such as ACE inhibitors
- Weight loss, particularly in those over the age of 40
- Painful or red, inflamed calf
- General malaise, feeling systemically unwell, persisting sweats or fever
- No improvement of symptoms after 14–21 days, depending on severity, or a deterioration in the condition with time

*Note that green sputum is commonly present in viral infections and may sometimes not justify referral, provided there are no other referable signs or symptoms. Purulent postnasal drip may also be mistaken for sputum, which would not normally require referral.

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Self-assessment questions

The following questions are provided to test the information presented in this chapter.

For questions 1–7 select the best answer in each case.

1. Select which of the following causes the common cold:
 - a. Paramyxoviruses
 - b. Rhabdoviruses
 - c. Picornaviruses
 - d. Togaviruses
 - e. Orthomyxoviruses
2. Select which of the following is not normally considered a symptom of the common cold:
 - a. Pyrexia
 - b. Aching limbs
 - c. Sore nose
 - d. Malaise
 - e. Rhinorrhoea

3. Select which of the following is the most common causative organism of sinusitis:
 - a. *Mycoplasma pneumoniae*
 - b. *Pseudomonas aeruginosa*
 - c. *Escherichia coli*
 - d. *Streptococcus pneumoniae*
 - e. *Klebsiella pneumoniae*
4. Select which of the following is not a caution for the use of pseudoephedrine:
 - a. Asthma
 - b. Hypertension
 - c. Pregnancy
 - d. Hyperthyroidism
 - e. Ischaemic heart disease
5. Select which of the following drugs interacts with antihistamines:
 - a. Salbutamol
 - b. Paracetamol
 - c. Beclometasone
 - d. Fluoxetine
 - e. Diazepam
6. Select which of the following is not a feature of influenza:
 - a. Fever
 - b. Shivering
 - c. Aching limbs
 - d. Abrupt onset
 - e. Sinusitis
7. Select which of the following best describes the symptoms of croup:
 - a. Severe and violent paroxysmal cough with stridor
 - b. Productive cough accompanied by vomiting
 - c. Whoop on inspiration
 - d. Stridor
 - e. Productive cough with pink and frothy phlegm

For questions 8–10 select from the list below one lettered option which is most closely related to it. Each lettered option may be used once, more than once, or not at all.

- a. productive cough
 - b. non-productive cough
 - c. acute cough
 - d. subacute cough
 - e. chronic cough
8. Has a duration of less than 3 weeks.
 9. Is a typical response to damage to the upper respiratory tract epithelium by air pollution.
 10. Can be an adverse drug reaction to lisinopril.

For questions 11–12 select from the list below one lettered option which is most closely related to it. Each lettered option may be used once, more than once, or not at all.

- a. chlorphenamine
 - b. loratadine
 - c. pseudoephedrine
 - d. acrivastine
 - e. azelastine
11. Is available as a nasal spray and as eye drops.
 12. Has a cough suppressant action.

Questions 13–16: Each of the questions or incomplete statements in this section is followed by three responses. For each question one or more of the responses is/are correct. Decide which of the responses is/are correct and then choose a–e as indicated in the table below.

Directions summarised

a	b	c	d	e
If 1, 2 and 3 are correct	If 1 and 2 only are correct	If 2 and 3 only are correct	If 1 only is correct	If 3 only is correct

13. The following medicines can be supplied from a pharmacy without a prescription to treat allergic rhinitis:
 - 1 – loratadine tablets
 - 2 – sodium cromoglicate eye drops
 - 3 – beclometasone nasal spray
14. The following medicines can be supplied from a pharmacy without a prescription to treat allergic rhinitis in someone who is 16 years old:
 - 1 – loratadine tablets
 - 2 – sodium cromoglicate eye drops
 - 3 – beclometasone nasal spray
15. A liquid cough medicine containing pholcodine can be used to treat:
 - 1 – a cough producing clear, straw coloured sputum
 - 2 – a dry, irritating cough in a 12 year old child
 - 3 – a dry, irritating cough that has lasted for 7 days in a non-smoking adult
16. Tonsillitis
 - 1 – causes the tonsils to appear red and swollen
 - 2 – can be caused by bacterial or viral infection
 - 3 – always requires treatment with antibiotics

Questions 17–20 consist of two statements linked by the word because; decide whether each statement is true or false. If both statements are true then decide whether the second statement is a correct explanation of the first statement. Choose a–e as your answer as indicated in the table below.

Directions summarised

	First statement	Second statement	
a	True	True	Second statement is a correct explanation of the first statement
b	True	True	Second statement is not a correct explanation of the first statement
c	True	False	
d	False	True	
e	False	False	

17.

Shortness of breath and dyspnoea are alarm symptoms that require referral for medical investigation	BECAUSE	Shortness of breath and dyspnoea can be indicative of chronic disease such as chronic bronchitis or cardiac failure
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18.

Anyone who complains of a sore throat and is taking carbimazole does not need further investigation	BECAUSE	Carbimazole has the potential to cause neutropenia and agranulocytosis
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19.

Earache that has not improved in 72 hours in someone complaining of a sore throat should be referred for medical investigation	BECAUSE	Infection in the pharynx can easily spread to the ear via the Eustachian tubes
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20.

Hoarseness that does not resolve within 5 days requires referral for medical investigation	BECAUSE	Hoarseness that has persisted for more than 5 days will need antibiotic treatment
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Answers

1-c; 2-b; 3-d; 4-a; 5-e; 6-e; 7-a; 8-c; 9-b; 10-b; 11-e; 12-a; 13-a; 14-b; 15-c; 16-b; 17-a; 18-d; 19-a; 20-c