Respiratory Problems

Colds and flu

The common cold comprises a mixture of viral upper respiratory tract infections (URTIs). Although colds are self-limiting, many people choose to buy over the counter (OTC) medicines for symptomatic relief. Some of the ingredients of OTC cold remedies may interact with prescribed therapy, occasionally with serious consequences. Therefore, careful attention needs to be given to taking a medication history and selecting an appropriate product.

What you need to know
Age (approximate)
Child, adult
Duration of symptoms
Runny/blocked nose
Summer cold
Sneezing/coughing
Generalised aches/headache
High temperature
Sore throat
Earache
Facial pain/frontal headache
Flu
Asthma
Previous history
Allergic rhinitis
Bronchitis
Heart disease
Present medication

Significance of questions and answers

Age

Establishing who the patient is – child or adult – will influence the pharmacist's decision about the necessity of referral to the doctor and

Symptoms in the Pharmacy: A Guide to the Management of Common Illness, Seventh Edition. Alison Blenkinsopp, Paul Paxton and John Blenkinsopp.

choice of treatment. Children are more susceptible to URTI than are adults.

Duration

Patients may describe a rapid onset of symptoms or a gradual onset over several hours; the former is said to be more commonly true of flu, the latter of the common cold. Such guidelines are general rather than definitive. The symptoms of the common cold usually last for 7–14 days. Some symptoms, such as a cough, may persist after the worst of the cold is over.

Symptoms

Runny/blocked nose

Most patients will experience a runny nose (rhinorrhoea). This is initially a clear watery fluid, which is then followed by the production of thicker and more tenacious mucus (this may be purulent). Nasal congestion occurs because of dilatation of blood vessels, leading to swelling of the lining surfaces of the nose. This narrows the nasal passages that are further blocked by increased mucus production.

Summer colds

In summer colds, the main symptoms are nasal congestion, sneezing and irritant watery eyes; these are more likely to be due to allergic rhinitis (see p. 54).

Sneezing/coughing

Sneezing occurs because the nasal passages are irritated and congested. A cough may be present (see p. 197) either because the pharynx is irritated (producing a dry, tickly cough) or as a result of irritation of the bronchus caused by postnasal drip.

Aches and pains/headache

Headaches may be experienced because of inflammation and congestion of the nasal passages and sinuses. A persistent or worsening frontal headache (pain above or below the eyes) may be due to sinusitis (see below and p. 33). People with flu often report muscular and joint aches and this is more likely to occur with flu than with the common cold (see below).

High temperature

Those suffering from a cold often complain of feeling hot, but in general a high temperature will not be present. The presence of fever may be an indication that the patient has flu rather than a cold (see below).

Sore throat

The throat often feels dry and sore during a cold and may sometimes be the first sign that a cold is imminent (see p. 45).

Earache

Earache is a common complication of colds, especially in children. When nasal catarrh is present, the ear can feel blocked. This is due to blockage of the Eustachian tube, which is the tube connecting the middle ear to the back of the nasal cavity. Under normal circumstances, the middle ear is an air-containing compartment. However, if the Eustachian tube is blocked, the ear can no longer be cleared by swallowing and may feel uncomfortable and deaf. This situation often resolves spontaneously, but decongestants and inhalations can be helpful (see 'Management' below). Sometimes the situation worsens when the middle ear fills up with fluid. This is an ideal site for a secondary infection to settle. When this does occur, the ear becomes acutely painful and is called acute otitis media (AOM). AOM is a common infection in young children. The evidence for antibiotic use is conflicting with some trials showing benefit and others showing no benefit for taking antibiotics. In about 80% of children, AOM will resolve spontaneously in about 3 days without antibiotics. Antibiotics have also been shown to increase the risk of vomiting, diarrhoea and rash.

In summary, a painful ear can initially be managed by the pharmacist. There is evidence that both *paracetamol* and *ibuprofen* are effective treatments for AOM. However, if pain were to persist or be associated with an unwell child (e.g. high fever, very restless or listless, vomiting), then referral to the GP would be advisable.

Facial pain/frontal headache

Facial pain or frontal headache may signify sinusitis. Sinuses are air-containing spaces in the bony structures adjacent to the nose (maxillary sinuses) and above the eyes (frontal sinuses). In a cold, their lining surfaces become inflamed and swollen, producing catarrh. The secretions drain into the nasal cavity. If the drainage passage becomes blocked, fluid builds up in the sinus and can become secondarily (bacterially) infected. If this happens, persistent pain arises in the sinus areas. The maxillary sinuses are most commonly involved. A recent systematic review indicated only a small benefit from antibiotics even in sinusitis that had lasted for longer than 7 days infection. Antibiotics are, however, recommended if the symptoms of sinusitis: persist for more than 10 days; are severe with fever, facial pain, nasal discharge over 3–4 days; or when sinusitis symptoms develop following a recent cold which has started to settle.

Flu

Differentiating between colds and flu may be needed to make a decision about whether referral is needed. Patients in 'at-risk' groups might be considered for antiviral treatment. Flu is generally considered to be likely if:

- temperature is 38°C or higher (37.5°C in the elderly);
- a minimum of one respiratory symptom – cough, sore throat, nasal congestion or rhinorrhoea – is present; or
- a minimum of one constitutional symptom – headache, malaise, myalgia, sweats/chills, prostration – is present.

Flu often starts abruptly with sweats and chills, muscular aches and pains in the limbs, a dry sore throat, cough and high temperature. Someone with flu may be bedbound and unable to go about usual activities. There is often a period of generalised weakness and malaise following the worst of the symptoms. A dry cough may persist for some time.

True influenza is relatively uncommon compared to the large number of flu-like infections that occur. Influenza is generally more unpleasant, although both usually settle with no need for referral.

Flu can be complicated by secondary lung infection (pneumonia). Complications are much more likely to occur in the very young, the very old and those who have pre-existing heart disease, respiratory disease (asthma or chronic obstructive pulmonary disease (COPD)), kidney disease, a weak immune system or diabetes. Warning that complications are developing may be given by a severe or productive cough, persisting high fever, pleuritic-type chest pain (see p. 62) or delirium.

Asthma

Asthmatic attacks can be triggered by respiratory viral infections. Most asthma sufferers learn to start or increase their usual medication to prevent such an occurrence. However, if these measures fail, referral is recommended.

Previous history

People with a history of chronic bronchitis, also known as COPD may need referral. COPD should be considered in patients over the age of 35 who have a risk factor such as smoking, and who have shortness of breath on exercise, long-term cough, regular sputum production, and frequent winter 'bronchitis' or wheeze. Such patients may be advised to see their doctor if they have a bad cold or flu-like infection, as it often causes an exacerbation of their bronchitis. In this situation, the doctor is likely to increase the dose of inhaled anticholinergics and β-2 agonists and prescribe a course of antibiotics. Certain medications are best avoided in those with heart disease, hypertension and diabetes.

Present medication

The pharmacist must ascertain any medicines being taken by the patient. It is important to remember that interactions might occur with some of the constituents of commonly used OTC medicines.

If medication has already been tried for relief of cold symptoms with no improvement and if the remedies tried were appropriate and used for a sufficient amount of time, referral to the doctor might occasionally be needed. In most cases of colds and flu, however, OTC treatment will be appropriate.

When to refer
Earache not settling with analgesic (see above)
In the very young
In the very old
In those with heart or lung disease, for example, COPD, kidney disease, diabetes, compromised immune system
With persisting fever and productive cough
With delirium
With pleuritic-type chest pain
Asthma

Treatment timescale

Once the pharmacist has recommended treatment, patients should be advised to see their doctor in 10–14 days if the cold has not improved.

Management

The use of OTC medicines in the treatment of colds and flu is widespread, and such products are heavily advertised to the public. There is little doubt that appropriate symptomatic treatment can make the patient feel better; the placebo effect also plays an important part here. For some medicines used in the treatment of colds, particularly older medicines, there is little evidence available from which to judge effectiveness.

The pharmacist's role is to select appropriate treatment based on the patient's symptoms and available evidence, and taking into account the patient's preferences. Polypharmacy abounds in the area of cold treatments and patients should not be overtreated. The discussion of medicines that follows is based on individual constituents; the pharmacist can decide whether a combination of two or more drugs is needed.

The UK Commission on Human Medicines (CHM) made recommendations in 2009 about the safer use of cough and cold medicines

for children under 12 years of age. As a result, the UK Medicines and Healthcare products and Regulatory Agency (MHRA) advised that OTC cough and cold remedies should no longer be sold for children under 6 years.

Antitussives: dextromethorphan and pholcodine

Expectorants: guaifenesin and ipecacuanha

Nasal decongestants: ephedrine, oxymetazoline, phenylephrine, pseudoephedrine and xylometazoline

Antihistamines: brompheniramine, chlorphenamine, diphenhydramine, doxylamine, promethazine and triprolidine

Children aged between 6–12 can still use these preparations, but with an advice to limit treatment to 5 days or less. The MHRA rationale was that for children aged over 6 years, 'the risk from these ingredients is reduced because: they suffer from cough and cold less frequently and consequently require medicines less often; with increased age and size, they tolerate the medicines better; and they can say if the medicine is working'.

Decongestants

Sympathomimetics

Sympathomimetics (e.g. *pseudoephedrine*) can be effective in reducing nasal congestion. Nasal decongestants work by constricting the dilated blood vessels in the nasal mucosa. The nasal membranes are effectively shrunk, so drainage of mucus and circulation of air are improved and the feeling of nasal stuffiness is relieved. These medicines can be given orally or applied topically. Tablets and syrups are available, as are nasal sprays and drops. If nasal sprays/drops are to be recommended, the pharmacist should advise the patient not to use the product for longer than 7 days. Rebound congestion (rhinitis medicamentosa) can occur with topically applied but not oral sympathomimetics. The decongestant effects of topical products containing *oxymetazoline* or *xylometazoline* are longer lasting (up to 6 h) than those of some other preparations such as *ephedrine*. The pharmacist can give useful advice about the correct way to administer nasal drops and sprays.

Problems

Ephedrine and pseudoephedrine, when taken orally, have the theoretical potential to keep patients awake because of their stimulating effects on the central nervous system (CNS). In general, *ephedrine* is more likely to produce this effect than does *pseudoephedrine*. A systematic review found that the risk of insomnia with *pseudoephedrine* was small compared with placebo.

Sympathomimetics can cause stimulation of the heart, an increase in blood pressure and may affect diabetic control because they can increase blood glucose levels. They should be used with caution

(current *British National Formulary (BNF)* warnings) in people with diabetes, those with heart disease or hypertension and those with hyperthyroidism. The hearts of the hyperthyroid patients are more vulnerable to irregularity, so stimulation of the heart is particularly undesirable.

Sympathomimetics are most likely to cause these unwanted effects when taken by mouth and are unlikely to do so when used topically. Nasal drops and sprays containing sympathomimetics can therefore be recommended for those patients in whom the oral drugs are less suitable. Saline nasal drops or the use of inhalations would be other possible choices for patients in this group.

The interaction between sympathomimetics and monoamine oxidase inhibitors (MAOIs) is potentially extremely serious; a hypertensive crisis can be induced and several deaths have occurred in such cases. This interaction can occur up to 2 weeks after a patient has stopped taking the MAOI, so the pharmacist must establish any recently discontinued medication. There is a possibility that topically applied sympathomimetics could induce such a reaction in a patient taking an MAOI. It is therefore advisable to avoid both oral and topical sympathomimetics in patients taking MAOIs.

Cautions:
diabetes
heart disease
hypertension
hyperthyroidism

Interactions: Avoid in those taking
MAOIs (e.g. *phenelzine*)
reversible inhibitors of monoamine oxidase A (e.g. *moclobemide*)
beta-blockers
tricyclic antidepressants (e.g. *amitriptyline*) – a theoretical interaction that appears not to be a problem in practice

Restrictions on sales of pseudoephedrine and ephedrine

In response to concerns about the possible extraction of *pseudoephedrine* and *ephedrine* from OTC products for use in the manufacture of methamphetamine (crystal meth), restrictions were introduced in 2007. The medicines are available only in small pack sizes, with a limit of one pack per customer, and their sale has to be made by a pharmacist.

Antihistamines **(see also p. 57)**

Antihistamines could theoretically reduce some of the symptoms of a cold: runny nose (rhinorrhoea) and sneezing. These effects are due

to the anticholinergic action of antihistamines. The older drugs (e.g. *chlorphenamine (chlorpheniramine), promethazine*) have more pronounced anticholinergic actions than do the non-sedating antihistamines (e.g. *loratadine, cetirizine, acrivastine*). Antihistamines are not so effective at reducing nasal congestion. Some (e.g. *diphenhydramine*) may also be included in cold remedies for their supposed antitussive action (see p. 40) or to help the patient to sleep (included in combination products intended to be taken at night). Evidence indicates that antihistamines alone are not of benefit in the common cold but that they may offer limited benefit for adults in combination with decongestants, analgesics and cough suppressants.

Interactions: The problem of using antihistamines, particularly the older types (e.g. *chlorphenamine*), is that they can cause drowsiness. Alcohol will increase this effect, as will drugs such as *benzodiazepines* or *phenothiazines* that have the ability to cause drowsiness or CNS depression. Antihistamines with known sedative effects should not be recommended for anyone who is driving, or in whom an impaired level of consciousness may be dangerous (e.g. operators of machinery at work).

Because of their anticholinergic activity, the older antihistamines may produce the same adverse effects as anticholinergic drugs (i.e. dry mouth, blurred vision, constipation and urinary retention). These effects are more likely if antihistamines are given concurrently with anticholinergics such as *hyoscine* or with drugs that have anticholinergic actions such as tricyclic antidepressants.

Antihistamines should be avoided in patients with prostatic hypertrophy and closed-angle glaucoma because of possible anticholinergic side effects. In patients with closed-angle glaucoma, they may cause increased intraocular pressure. Anticholinergic drugs can occasionally precipitate acute urinary retention in pre-disposed patients, for example, men with prostatic hypertrophy.

While the probability of such serious adverse effects is low, the pharmacist should be aware of the origin of possible adverse effects from OTC medicines.

At high doses, antihistamines can produce stimulation rather than depression of the CNS. There have been occasional reports of fits being induced at very high doses of antihistamines and it is for this reason that it has been argued that they should be avoided in epileptic patients. However, this appears to be a theoretical rather than a practical problem.

Interactions:
Alcohol
Hypnotics

Sedatives
Betahistine
Anticholinergics

Side effects:
- Drowsiness (driving, occupational hazard)
- Constipation
- Blurred vision

Cautions:
Closed-angle glaucoma
Prostatic obstruction
Epilepsy
Liver disease

Zinc

Two systematic reviews have found limited evidence that *zinc gluconate* or *acetate lozenges* may reduce continuing symptoms at 7 days compared with placebo.

Echinacea

A systematic review of trials indicated that some echinacea preparations may be better than placebo or no treatment for the prevention and treatment of colds. However, due to variations in preparations containing echinacea, there is insufficient evidence to recommend a specific product. Echinacea has been reported to cause allergic reactions and rash.

Vitamin C

A systematic review found that high-dose vitamin C (over 1 g/day) taken prophylactically reduced the duration of colds by about 8%.

Cough remedies

For discussion of products for the treatment of cough, see p. 38.

Analgesics

For details of analgesics, their uses and side effects, see p. 199.

Products for sore throats

For discussion of products for the treatment of sore throat, see p. 45.

Practical points

Inhalations

These may be useful in reducing nasal congestion and soothing the air passages, particularly if a productive cough is present. Inhalants that

can be used on handkerchiefs, bedclothes and pillowcases are available. These usually contain aromatic ingredients such as eucalyptus. Such products can be useful in providing some relief, but are not as effective as steam-based inhalations in moistening the airways.

Nasal sprays or drops?

Nasal sprays are preferable for adults and children over 6 years because the small droplets in the spray mist reach a large surface area. Drops are more easily swallowed, which increases the possibility of systemic effects.

For children under 6 years, drops are preferred because in young children the nostrils are not sufficiently wide to allow the effective use of sprays. Paediatric versions of nasal drops should be used where appropriate. Nasal saline drops or sprays are a useful option to consider in nasal congestion in babies and young children.

Prevention of flu

Pharmacists should encourage those in at-risk groups to have an annual flu vaccination. In the United Kingdom, the health service now provides vaccinations to all patients over 65 years and those below that age who have chronic respiratory disease (including asthma), chronic heart disease, chronic renal failure, diabetes mellitus or immunosuppression due to disease or treatment. Community pharmacists are in a good position to use their patient medication records (PMRs) to target patients each autumn and remind them to have their vaccination.

A nasal spray containing a viscous gel is marketed with claims that it prevents progression of the first signs of a cold into a full-blown infection. It is used four times a day from the time symptoms are experienced. The theoretical basis for its action is that the gel is slightly acidic (whereas viruses are said to prefer an alkaline environment) and that its viscous nature traps the viruses. There are no published trials of effectiveness.

Increasing attention is being paid to ways of reducing transmission of the influenza virus. Routine handwashing with soap and water reduces the transmission of cold and flu viruses. Hand sanitizers have become widely used because immediate access to soap and water is difficult in many everyday settings. Transfer of the cold or flu virus usually occurs directly from person to person when an infected individual coughs or sneezes. Droplets of respiratory secretions come into contact with the mucous membranes of the mouth and nose of another person. Ethanol-based hand sanitizers are widely used in health care settings and can contribute to reducing transmission of colds and flu. The influenza virus is susceptible to alcohol in formulations of 60–95% ethanol. The rationale is that the virus in droplets can survive for 24–48 h on hard, non-porous surfaces, for 8–12 h on cloth, paper and tissue, and for

5 min on hands. Touching contaminated hands, surfaces and objects can therefore transfer the virus.

Flu pandemic

There have been three flu pandemics over the last century, occurring in 1918, 1957 and 1968. Concerns about a potential pandemic have arisen because of the emerging strains of influenza from animals or birds (zoonoses). In 1997, an avian H5N1 strain of influenza emerged, which has a high mortality rate. Although the virus is highly virulent, it does not spread easily between humans. Nearly all, if not all, cases have been spread from contact between humans and infected birds. The concern is that the virus may mutate, making transmission between humans more likely. As there is no natural immunity to this virus, a pandemic could follow, and if the virulence remained unchanged then it could be extremely deadly. It is not possible to predict how likely this scenario is. Another H1N1 influenza virus spread from pigs in 2009. Further information available from the World Health Organization (WHO) at www.who.int

The Department of Health has issued various publications detailing the evidence base for dealing with a pandemic, specifically making recommendations on vaccination, use of antivirals and antibiotics as well as the use of face masks. Anyone who is ill with influenza-type symptoms will be advised to stay at home. Further advice can be found at http://www.dh.gov.uk

Antivirals

The effectiveness of antivirals during a pandemic cannot be known until used in such a situation and can only be guessed at based on experience in seasonal influenza and in those infected with avian flu. It is believed that they are likely to reduce the chance of developing complications, reduce the chance of dying and shorten the time taken to recover from an infection. It is possible that using antivirals for the non-infected members of a household when another member has the infection could reduce the spread of the pandemic. There is uncertainty as to how much resistance to antivirals could be present in a pandemic virus.

Three antiviral products are licensed for use: *oseltamivir, zanamivir* and *amantadine*. Only the *oseltamivir* and *zanamivir* neuraminidase inhibitors are recommended by the UK Department of Health and WHO for use in a pandemic. The UK National Institute for Health and Care Excellence (NICE) does not have recommendations for a pandemic but supports the use of neuraminidase inhibitors for those who are in at-risk groups in seasonal flu outbreaks, if treatment is started within 48 h of symptom onset. *Amantadine* is generally not

recommended because of its lower efficacy, side effects, and because rapid resistance can develop to its use.

Surgical face masks

The Department of Health and WHO have looked at the evidence concerning the use of surgical face masks in a flu pandemic. Their recommendations are that the general public can use them but are not encouraged to do so. There is insufficient evidence to support their use. They are, however, recommended in health-care settings, and they may be of value in infected households both for the symptomatic person and non-infected members and carers, and for symptomatic people outside the home. There is concern that the masks may not be used safely; that is, they may be worn too long and get too wet and therefore ineffective, be worn at times around the neck, not disposed of correctly, and there may be a failure to wash hands after touching the mask. There is also concern that symptomatic people wearing masks continue to meet with people outside the home when it would be best to be isolated at home.

Antibiotics

A serious complication of flu is the development of pneumonia and this can be either directly due to the flu virus or due to a secondary bacterial infection. In the case of a viral pneumonia, antibiotics are of no value although clinically it is difficult to tell the difference, and antibiotics are usually given in a hospital setting with a severe illness. Avian flu outbreaks have been mainly complicated by viral pneumonia.

Most uncomplicated infections in the community do not require antibiotics. They are now recommended for those at risk, such as people who have pre-existing COPD, compromised immunity, diabetes, heart or lung disease. In these situations, if there is no improvement within 48 h of starting antibiotics, then the person should be seen by the GP.

Typical flu symptoms include cough, retrosternal discomfort, wheeze and phlegm (symptoms of acute bronchitis), and by themselves do not require antibiotics in a person who is not at risk. However, if these symptoms worsen with a persistent or recrudescent (recurring) fever, pleuritic-type chest pain or breathlessness, then a pneumonia might be developing. In this situation, review by a GP would be essential and either treatment with antibiotics in the community or hospital admission could follow.

Colds and flu in practice

Case 1

Mrs Allen, a regular customer in her late 60s, asks what you can recommend for her husband. He has a very bad cold; the worst symptoms

are his blocked nose and sore throat. Although his throat feels sore, she tells you there is only a slight reddening (she looked this morning). He has had the symptoms since last night and is not feverish. He does not have earache but has complained of a headache. When you ask her if he is taking any medicines, she says yes, quite a few for his heart. She cannot remember what they are called. You check the PMR and find that he is taking *aspirin* 75 mg daily, *ramipril* 5 mg daily, *bisoprolol* 10 mg daily and *simvastatin* 40 mg daily. Mrs Allen asks you if it is worth her husband taking extra vitamin C as she has heard this is good for colds. She wondered if this might be better than taking yet more medicines.

The pharmacist's view

The patient's symptoms indicate a cold rather than flu. He is concerned most with his congested nose and sore throat. He is taking a number of medications, which indicate that oral sympathomimetics would be best avoided. You could recommend that he take regular simple painkillers for his sore throat and a topical decongestant or an inhalation to clear his blocked nose. The symptoms may take about 1 week before they start to clear. You offer these alternatives to Mrs Allen to see what she thinks her husband might prefer. You explain that taking vitamin C might reduce the time taken for the cold to get better by about half a day. You show her some vitamin C products and tell her their cost. You also ask if Mr Allen has had a flu jab as he is in an 'at-risk' group.

The doctor's view

The advice given by the pharmacist is sensible. A simple analgesic such as *paracetamol* could help both the headache and sore throat. The development of sinusitis at such an early stage in an infection would be unlikely but it would be wise to enquire whether his colds are usually uncomplicated and to ascertain the site of his headache.

The patient's view

I came to the pharmacist because we didn't want to bother the doctor. The pharmacist asked me about which symptoms were causing Pete (my husband) the biggest problem and he gave me a choice of what to use. I wanted to know what he thought about vitamin C and he told me about how it might make the cold shorter. In the end though I decided not to bother with it because it would have been quite expensive with the other medicines as well, especially as it was unlikely to make that much difference. I thought I would give him some fresh orange juice instead.

Case 2

A man comes into the pharmacy just after Xmas asking for some cough medicine for his wife. He says that the medicine needs to be sugar-free as his wife has diabetes. On listening to him further, he says she has had a dreadful cough that keeps her awake at night. Her problem came on 5 days ago when she woke in the morning, complaining of being very achy all over and then became shivery, and developed a high temperature and cough by the evening. Since then her temperature has gone up and down and she has not been well enough to get out of bed for very long. She takes *glipizide* and *metformin* for her diabetes and he has been checking her glucometer readings, which have all been between 8 and 11 – a little higher than usual. The only other treatment she is taking is *atorvastatin;* she is not on any antihypertensives. He tells you that she will be 70 next year.

The pharmacist's view

The history indicates flu. It would be best for this woman to be seen by her GP. She has been ill for 5 days and has been mostly bedbound during this time. There are several features that suggest she might be at higher risk from flu. I would suggest that her husband call the doctor out to see her, as she does not sound well enough to go to the surgery. Sometimes people are reluctant to call the doctor as they feel they might be 'bothering' the doctor unnecessarily. The pharmacist's support is often helpful.

The doctor's view

The infection is likely to be flu. She is in the higher-risk group for developing complications (age and diabetes), so it would be reasonable to advise referral. Most cases of flu usually resolve within 7 days. The complications can include AOM, bacterial sinusitis, bacterial pneumonia and, less commonly, viral pneumonia and respiratory failure. Worldwide there are about 3–5 million severe cases of flu in seasonal outbreaks resulting in between 250 000 and 500 000 deaths per year, most of the deaths occurring over 65s (WHO, 2009, www.who.int).

In this situation, the doctor would want to check her chest for signs of a secondary infection. A persisting or worsening fever would point to a complication developing. There would be little point in prescribing an antiviral, for example, *zanamivir*, as it is only effective if started within 2 days of symptom onset. One review has found it to be effective in reducing the duration of flu symptoms by about 1 day if started soon enough. It would also be advisable to check whether or not her husband had had the flu vaccine. The incubation time for flu is 1–4 days and adults are contagious from the day before symptoms start until 5 days after the onset of symptoms.

Cough

Coughing is a protective reflex action caused when the airway is being irritated or obstructed. Its purpose is to clear the airway so that breathing can continue normally. The majority of coughs presenting in the pharmacy will be caused by a viral URTI. They will often be associated with other symptoms of a cold. The evidence to support the use of cough suppressants and expectorants is not strong but some patients report finding them helpful.

What you need to know

- Age (approximate)
  - Baby, child, adult
- Duration
- Nature
  - Dry or productive
- Associated symptoms
  - Cold, sore throat, fever
  - Sputum production
  - Chest pain
  - Shortness of breath
  - Wheeze
- Previous history
  - COPD (chronic bronchitis, emphysema, chronic obstructive airways disease)
  - Asthma
  - Diabetes
  - Heart disease
  - Gastro-oesophageal reflux
  - Smoking habit
- Present medication

Significance of questions and answers

Age

Establishing who the patient is – child or adult – will influence the choice of treatment and whether referral is necessary.

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Duration

Most coughs are self-limiting and will be better within a few days with or without treatment. In general, a cough of longer than 2 weeks' duration that is not improving should be referred to the doctor for further investigation.

Patients are often concerned when a cough has lasted for, what seems to them to be, a long time. They may be worried that because the cough has not resolved, it may have a serious cause.

Nature of cough

Unproductive (dry, tickly or tight)

In an unproductive cough, no sputum is produced. These coughs are usually caused by viral infection and are self-limiting.

Productive (chesty or loose)

Sputum is normally produced. It is an oversecretion of sputum that leads to coughing. Oversecretion may be caused by irritation of the airways due to infection, allergy, etc., or when the cilia are not working properly (e.g. in smokers). Non-coloured (clear or whitish) sputum is uninfected and known as mucoid.

Coloured sputum may sometimes indicate a bacterial chest infection such as bronchitis or pneumonia and require referral. In these situations, the sputum is described as green, yellow or rust-coloured thick mucus and the patient is more unwell perhaps with a raised temperature, shivers and sweats. Sometimes blood may be present in the sputum (haemoptysis), with a colour ranging from pink to deep red. Blood may be an indication of a relatively minor problem such as a burst capillary following a bout of violent coughing during an acute infection, but may be a warning of more serious problems. Haemoptysis is an indication for referral.

Antibacterials/antibiotics are not usually indicated for previously healthy people with acute bronchitis. Most cases of acute bronchitis are caused by viral infections, so antibacterials will not help. Two systematic reviews of antibacterials for acute bronchitis found only slight benefit, possibly reducing the duration of illness by about half a day. Some people who have a tendency towards asthma develop a wheezy bronchitis with a respiratory viral infection. They may benefit from inhalation treatment used in asthma.

If a person has had repeated episodes of bronchitis over the years, they might have COPD (defined as a chronic cough, sputum, shortness of breath on exertion, wheeze, with a risk factor such as smoking when other causes of chronic cough have been excluded). So careful questioning is important to determine this.

There is general consensus that antibacterials should be considered if the person is elderly, has reduced resistance to infection, has comorbidity (such as diabetes or heart failure) or is deteriorating clinically.

In heart failure and mitral stenosis, the sputum is sometimes described as pink and frothy or can be bright red. Confirming symptoms would be breathlessness (especially in bed during the night) and swollen ankles.

Tuberculosis

Until recently thought of as a disease of the past, the number of tuberculosis (TB) cases has been rising in the United Kingdom and there is increasing concern about resistant strains. Chronic cough with haemoptysis associated with chronic fever and night sweats are classical symptoms. TB is largely a disease of poverty and more likely to present in disadvantaged communities. In the United Kingdom, most cases of respiratory TB are seen in ethnic minority groups, especially Indians and Africans. Human immunodeficiency virus (HIV) infection is a significant risk factor for the development of respiratory TB.

Croup (acute laryngotracheitis)

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.

Whooping cough (pertussis)

Whooping cough starts with catarrhal symptoms. The characteristic whoop is not present in the early stages of infection. The whoop is the sound produced when breathing in after a paroxysm of coughing. The bouts of coughing prevent normal breathing and the whoop represents the desperate attempt to get a breath. Referral is necessary.

Associated symptoms

Cold, sore throat and catarrh may be associated with a cough. Often there may be a temperature and generalised muscular aches present. This would be in keeping with a viral infection and be self-limiting. Chest pain, shortness of breath or wheezing are all indications for referral (see p. 62).

Postnasal drip

Postnasal drip is a common cause of coughing and may be due to sinusitis (see p. 21).

Previous history

Certain cough remedies are best avoided in diabetics and anyone with heart disease or hypertension (see p. 40).

Chronic bronchitis

Questioning may reveal a history of chronic bronchitis, which is being treated by the doctor with antibiotics. In this situation, further treatment may be possible with an appropriate cough medicine.

Asthma

A recurrent night-time cough can indicate asthma, especially in children, and should be referred. Asthma may sometimes present as a chronic cough without wheezing. A family history of eczema, hay fever and asthma is worth asking about. Patients with such a family history appear to be more prone to extended episodes of coughing following a simple URTI.

Cardiovascular

Coughing can be a symptom of heart failure (see p. 65). If there is a history of heart disease, especially with a persisting cough, then referral is advisable.

Gastro-oesophageal

Gastro-oesophageal reflux can cause coughing. Sometimes such reflux is asymptomatic apart from coughing. Some patients are aware of acid coming up into their throat at night when they are in bed.

Smoking habit

Smoking will exacerbate a cough and can cause coughing since it is irritating to the lungs. One in three long-term smokers develop a chronic cough. If coughing is recurrent and persistent, the pharmacist is in a good position to offer health education advice about the benefits of stopping smoking, suggesting nicotine replacement therapy where appropriate. However, on stopping, the cough may initially become worse as the cleaning action of the cilia is re-established during the first few days and it is worth mentioning this. Smokers may assume their cough is harmless, and it is always important to ask about any change in the nature of the cough that might suggest a serious cause (see also 'Smoking cessation' in the chapter on 'Prevention of Heart Disease').

Present medication

It is always essential to establish which medicines are currently being taken. This includes those prescribed by a doctor and any bought OTC, borrowed from a friend or neighbour or rediscovered in the

family medicine chest. It is important to remember the possibility of interactions with cough medicine.

It is also useful to know which cough medicines have been tried already. The pharmacist may decide that an inappropriate preparation has been taken, for example, a cough suppressant for a productive cough. If one or more appropriate remedies have been tried for an appropriate length of time without success, then referral is advisable.

Angiotensin-converting enzyme inhibitors

Chronic coughing may occur in patients, particularly women, taking angiotensin-converting enzyme (ACE) inhibitors such as *enalapril, captopril, lisinopril* and *ramipril*. Patients may develop the cough within days of starting treatment or after a period of a few weeks or even months. The exact incidence of the reaction is not known and estimates vary from 2% to 10% of patients taking ACE inhibitors. ACE inhibitors control the breakdown of bradykinin and other kinins in the lungs, which can trigger a cough. Typically the cough is irritating, non-productive and persistent. Any ACE inhibitor may induce coughing and there seems to be little advantage to be gained in changing from one to another. The cough may resolve or may persist; in some patients, the cough is so troublesome and distressing that ACE inhibitor therapy may have to be discontinued. Any patients in whom medication is suspected as the cause of a cough should be referred to their doctor. Angiotensin-2 receptor antagonists, which have similar properties to ACE inhibitors and which do not affect bradykinin, can be used as an alternative preparation if cough is a problem.

When to refer
Cough lasting 2 weeks or more and not improving
Sputum (yellow, green, rusty or bloodstained)
Chest pain
Shortness of breath
Wheezing
Whooping cough or croup
Recurrent nocturnal cough
Suspected adverse drug reaction
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

Depending on the length of time the patient has had the cough and once the pharmacist has recommended an appropriate treatment, patients should see their doctor 2 weeks after the cough started if it has not improved.

Management

Pharmacists are well aware of the debate about the clinical efficacy of the cough remedies available OTC. A systematic review concluded that 'there is no good evidence for or against the effectiveness of OTC medicines in acute cough'. However, many people who visit the pharmacy for advice do so because they want some relief from their symptoms and, while the clinical effectiveness of cough remedies is debatable, they can have a useful placebo effect.

The choice of treatment depends on the type of cough. Suppressants (e.g. *pholcodine*) are used to treat unproductive coughs, while expectorants such as *guaifenesin* (*guaiphenesin*) are used in the treatment of productive coughs. The pharmacist should check that the preparation contains an appropriate dose, since some products contain subtherapeutic amounts. Demulcents like *Simple Linctus* that soothe the throat are particularly useful in children and pregnant women as they contain no active ingredients.

The *BNF* gives the following guidance:

Expectorants are claimed to promote expulsion of bronchial secretions, but there is no evidence that any drug can specifically facilitate expectoration.
Suppressants: Where there is no identifiable cause (underlying disorder), cough suppressants may be useful; for example, if sleep is disturbed.
Demulcents: Preparations such as *Simple Linctus* have the advantage of being harmless and inexpensive. Paediatric *Simple Linctus* is particularly useful in children.

Compound preparations are on sale to the public for the treatment of cough and colds but should not be used in children under 6 years of age; the rationale for some is dubious. Care should be taken to give the correct dose and to not use more than one preparation at a time.

Productive coughs should not be treated with cough suppressants because pooling and retention of mucus in the lungs can result leading to a higher chance of infection, especially in chronic bronchitis.

There is no logic in using expectorants (which promote coughing) and suppressants (which reduce coughing) together as they have opposing effects. Therefore, products that contain both are not

therapeutically sound. The UK CHM made recommendations in 2009 about safer use of cough and cold medicines for children aged under 12 (see p. 23).

Cough suppressants

Controlled trials have not confirmed any significant effect of cough suppressants over placebo on symptom reduction.

Codeine/pholcodine

Pholcodine has several advantages over *codeine* in that it produces fewer side effects (even at OTC doses *codeine* can cause constipation and, at high doses, respiratory depression) and *pholcodine* is less liable to be abused. Both *pholcodine* and *codeine* can induce drowsiness, although in practice this does not appear to be a problem. Nevertheless, it is sensible to give an appropriate warning. *Codeine* is well known as a drug of abuse and many pharmacists choose not to recommend it. Sales often have to be refused because of knowledge or likelihood of abuse. The MHRA/CHM advise that codeine-containing cough suppressants should not be used for children under 18. *Pholcodine* can be given at a dose of 5 mg to children over 6 years (5 mg of *pholcodine* is contained in 5 mL of *Pholcodine Linctus BP*). Adults may take doses of up to 15 mg three or four times daily. The drug has a long half-life and may be more appropriately given as a twice-daily dose.

Dextromethorphan

Dextromethorphan is less potent than *pholcodine* and *codeine*. It is generally non-sedating and has few side effects. Occasionally, drowsiness had been reported but, as for *pholcodine,* this does not seem to be a problem in practice. *Dextromethorphan* can be given to children of 6 years and over. *Dextromethorphan* was generally thought to have a low potential for abuse. However, there have been rare reports of mania following abuse and consumption of very large quantities, and pharmacists should be aware of this possibility if regular purchases are made.

Demulcents

Preparations such as *glycerine, lemon* and *honey* or *Simple Linctus* are popular remedies and are useful for their soothing effect. They do not contain any active ingredient and are considered to be safe in children and pregnant women. They are now the treatment recommended for children under 6.

Expectorants

Two mechanisms have been proposed for expectorants. They may act directly by stimulating bronchial mucus secretion, leading to increased

liquefying of sputum, making it easier to cough up. Alternatively, they may act indirectly via irritation of the gastrointestinal tract, which has a subsequent action on the respiratory system, resulting in increased mucus secretion. This latter theory has less convincing evidence than the former to support it.

Guaifenesin (guaiphenesin)

Guaifenesin is commonly found in cough remedies. In adults, the dose required to produce expectoration is 100–200 mg, so in order to have a theoretical chance of effectiveness, any product recommended should contain a sufficiently high dose. Some OTC preparations contain sub-therapeutic doses. In the United States of America, the FDA (the licensing body) reviewed OTC medicines, and evidence from studies supporting *guaifenesin* was sufficiently strong for the FDA to be convinced of its efficacy.

Cough remedies: other constituents

Antihistamines

Examples used in OTC products include *diphenhydramine* and *promethazine*. Theoretically, these reduce the frequency of coughing and have a drying effect on secretions, but in practice they also induce drowsiness. Combinations of antihistamines with expectorants are illogical and best avoided. A combination of an antihistamine and a cough suppressant may be useful in that antihistamines can help to dry up secretions and the combination can be given as a night-time dose if the cough is disturbing sleep. This is one of the rare occasions when a side effect proves useful. The non-sedating antihistamines are less effective in symptomatic treatment of coughs and colds because of their less pronounced anticholinergic actions.

Interactions: Traditional antihistamines should not be used by patients who are taking *phenothiazines* and tricyclic antidepressants because of additive anticholinergic and sedative effects. Increased sedation will also occur with any drug that has a CNS depressant effect. Alcohol should be avoided because this will also lead to increased drowsiness. See pp. 57–58 for more details of interactions, side effects and contraindications of antihistamines.

Sympathomimetics

Pseudoephedrine is used in cough and cold remedies (see also p. 24 and p. 25 for information on restrictions on sales) for its bronchodilatory and decongestant actions. It has a stimulant effect that may theoretically lead to a sleepless night if taken close to bedtime. It may be useful if the patient has a blocked nose as well as a cough and an expectorant/decongestant combination can be useful in productive coughs. Sympathomimetics can cause raised blood pressure, stimulation of

the heart and alterations in diabetic control. Oral sympathomimetics should be used with caution in patients with the following.

Diabetes
Coronary heart disease (e.g. angina)
Hypertension
Hyperthyroidism

Interactions: Avoid in those taking
monoamine oxidase inhibitors (e.g. *phenelzine*)
reversible inhibitors of monoamine oxidase A (e.g. *moclobemide*)
beta-blockers
tricyclic antidepressants (e.g. *amitriptyline*) – a theoretical interaction that appears not to be a problem in practice

Theophylline

Theophylline is sometimes included in cough remedies for its bronchodilator effect. OTC medicines containing *theophylline* should not be taken at the same time as prescribed *theophylline* since toxic blood levels and side effects may occur. The action of *theophylline* can be potentiated by some drugs, for example, *cimetidine* and *erythromycin.*

Levels of *theophylline* in the blood are reduced by smoking and drugs such as *carbamazepine, phenytoin* and *rifampicin* that induce liver enzymes, so the metabolism of *theophylline* is increased and lower serum levels result.

Side effects include gastrointestinal irritation, nausea, palpitations, insomnia and headaches. The adult dose is typically 120 mg, three or four times daily. It is not recommended in children.

Practical points

Diabetes

In short-term acute conditions, the amount of sugar in cough medicines is relatively unimportant. Diabetic control is often upset during infections and the additional sugar is now not considered to be a major problem. 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. As part of their contribution to improving dental health, pharmacists can ensure that they stock and display a range of sugar-free medicines.

Steam inhalations

These can be useful, particularly in productive coughs. A systematic review found that there was insufficient evidence to judge whether

there might be a benefit from this treatment. The steam helps to liquefy lung secretions and patients find the warm moist air comforting. While there is no evidence that the addition of medications to water produces a better clinical effect than steam alone, some may prefer to add a preparation such as *menthol* and *eucalyptus* or a proprietary inhalant. One teaspoonful of inhalant should be added to a pint of hot (not boiling) water and the steam inhaled. Apart from the risk of scalding, boiling water volatilises the constituents too quickly. A cloth or towel can be put over the head to trap the steam.

Fluid intake

Maintaining a high fluid intake helps to hydrate the lungs, and hot drinks can have a soothing effect. General advice to patients with coughs and colds should be to increase fluid intake.

Coughs in practice

Case 1

Mrs Patel, a woman in her early 20s, asks what you can recommend for her son's cough. On questioning, you find out that her son, Dillip, aged 4 years, has had a cough on and off for a few weeks. He gets it at night and it is disturbing his sleep, although he does not seem to be troubled during the day. She took Dillip to the doctor about 3 weeks ago, and the doctor explained that antibiotics were not needed and that the cough would get better by itself. The cough is not productive and she has given Dillip some *Simple Linctus* before he goes to bed but the cough is no better. Dillip is not taking any other medicines. He has no pain on breathing or shortness of breath. He has had a cold recently.

The pharmacist's view

This is a 4-year-old child who has a night-time cough of several weeks' duration. The doctor's advice was appropriate at the time Dillip saw him. However, referral to the doctor would be advisable because the cough is only present during the night. A recurrent cough in a child at night can be a symptom of asthma, even if wheezing is not present. It is possible that the cough is occurring as a result of bronchial irritation following his recent viral URTI. Such a cough can last for up to 6 weeks and is more likely to occur in those who have asthma or a family history of atopy (a pre-disposition to sensitivity to certain common allergens such as house dust mite, animal dander and pollen). Nevertheless, the cough has been present for several weeks without improvement and medical advice is needed.

The doctor's view

Asthma is an obvious possibility. It would be interesting to know if anyone else in the family suffers from asthma, hay fever or eczema, and whether Dillip has ever had hay fever or eczema. Any of these features would make the diagnosis more likely. Mild asthma may present in this way without the usual symptoms of shortness of breath and wheezing.

An alternative diagnosis could still include a viral URTI. Most coughs are more troublesome and certainly more obvious during the night. This can falsely give the impression that the cough is only nocturnal. It should also be remembered that both diagnoses could be correct, as a viral infection often initiates an asthmatic reaction. Because the diagnosis is uncertain and inhaled oral steroids may be appropriate, referral to the doctor is advisable.

If, after further history taking and examination, the doctor feels that asthma is a possibility, then the treatment would be based on the British Thoracic Society guidelines that are summarised in the *BNF*. Naturally this would only be carried out after full discussion and agreement with the parents. Many parents are loath to have their child labelled as an asthma sufferer. The next problem is to prescribe a suitable inhalation device for a 4-year-old child. This may be an inhaler with a spacer device or a breath-actuated inhaler or a dry-powder inhaler. It would be usual to try a twice-daily dosage for 2–3 weeks and then review for future management.

The parent's view

I was hoping the pharmacist could recommend something but she seemed to think Dillip should see the doctor. She didn't really explain why though.

Case 2

A man aged about 25 years asks if you can recommend something for his cough. He sounds as if he has a bad cold and looks a bit pale. You find out that he has had the cough for a few days, with a blocked nose and a sore throat. He has no pain on breathing or shortness of breath. The cough was chesty to begin with, but he tells you it is now tickly and irritating. He has not tried any medicines and is not taking any medicines from the doctor.

The pharmacist's view

This patient has the symptoms of the common cold and none of the danger signs associated with a cough that would make referral necessary. He is not taking any medicines, so the choice of possible treatments is wide. You could recommend something to treat his congested

nose as well as his cough, for example, a cough suppressant and a sympathomimetic. *Simple Linctus* and a systemic or topical decongestant would also be a possible option. If a topical decongestant were to be recommended, he should be warned to use it for no longer than 1 week to avoid the possibility of rebound congestion.

The doctor's view

The action suggested by the pharmacist is very reasonable. It may be worthwhile explaining that he is suffering from a viral infection that is self-limiting and should be better within a few days. If he is a smoker then it would be an ideal time to encourage him to stop.

Sore throat

Most people with a sore throat do not consult the doctor – only about 5% do so and many will consult their pharmacist. Most sore throats that present in the pharmacy will be caused by viral infection (90%), with only 1 in 10 being due to bacterial infection, so treatment with antibiotics is unnecessary in most cases. Clinically it is almost impossible to differentiate between the two. The majority of infections are self-limiting. Sore throats are often associated with other symptoms of a cold.

Once the pharmacist has excluded more serious conditions, an appropriate OTC medicine can be recommended.

What you need to know

- Age (approximate)
  - Baby, child, adult
- Duration
- Severity
- Associated symptoms
  - Cold, congested nose, cough
  - Difficulty in swallowing
  - Hoarseness
  - Fever
- Previous history
  - Smoking habit
- Present medication

Significance of questions and answers

Age

Establishing who the patient is will influence the choice of treatment and whether referral is necessary. Streptococcal (bacterial) throat infections are more likely in children of school age.

Symptoms in the Pharmacy: A Guide to the Management of Common Illness, Seventh Edition. Alison Blenkinsopp, Paul Paxton and John Blenkinsopp.

Duration

Most sore throats are self-limiting and will be better within 7–10 days. If it has been present for longer, then the patient should be referred to the doctor for further advice.

Severity

If the sore throat is described as being extremely painful, especially in the absence of cold, cough and catarrhal symptoms, then referral should be recommended when there is no improvement within 24–48 h.

Associated symptoms

Cold, catarrh and cough may be associated with a sore throat. There may also be a fever and general aches and pains. These are in keeping with a minor self-limiting viral infection.

Both hoarseness of longer than 3 weeks' duration and difficulty in swallowing (dysphagia) are indications for referral.

Previous history

Recurrent bouts of infection (tonsillitis) would mean that referral is best.

Smoking habit

Smoking will exacerbate a sore throat, and if the patient smokes then it can be a good time to offer advice and information about quitting. Surveys indicate that two-thirds of people who smoke want to stop (see also 'Smoking cessation' in the chapter on 'Prevention of Heart Disease').

Present medication

The pharmacist should establish whether any medication has been tried already to treat the symptoms. If one or more medicines have been tried without improvement, then referral to the doctor should be considered.

Current prescriptions are important and the pharmacist should question the patient carefully about them. Steroid inhalers (e.g. *beclometasone* or *budesonide*) can cause hoarseness and candidal infections of the throat and mouth. Generally, they tend to do this at high doses. Such infections can be prevented by rinsing the mouth with water after using the inhaler. It is also worthwhile checking the patient's inhaler technique. Poor technique with metered-dose inhalers can lead to large amounts of the inhaled drug being deposited at the back of the throat. If you suspect this is the problem, discuss with the doctor whether a device that will help coordination or perhaps a different inhaler might be needed.

Any patient taking *carbimazole* and presenting with a sore throat should be referred immediately. A rare side effect of *carbimazole* is agranulocytosis (suppression of white cell production in the bone marrow). The same principle applies to any drug that can cause agranulocytosis. A sore throat in such patients can be the first sign of a life-threatening infection.

Symptoms for direct referral

Hoarseness

Hoarseness is caused when there is inflammation of the vocal cords in the larynx (laryngitis). Laryngitis is typically caused by a self-limiting viral infection. It is usually associated with a sore throat and a hoarse, diminished voice. Antibiotics are of no value and symptomatic advice (see 'Management' below), which includes resting the voice, should be given. The infection usually settles within a few days and referral is not necessary.

When this infection occurs in babies, infants or small children, it can cause croup (acute laryngotracheitis) and present difficulty in breathing and stridor (see p. 35). In this situation, referral is essential.

When hoarseness persists for more than 3 weeks, especially when it is not associated with an acute infection, referral is necessary. There are many causes of persistent hoarseness, some of which are serious. For example, laryngeal cancer can present in this way and hoarseness may be the only early symptom. A doctor will normally refer the patient to an ear, nose and throat (ENT) specialist for accurate diagnosis.

Dysphagia

Difficulty in swallowing can occur in severe throat infection. It can happen when an abscess develops in the region of the tonsils (quinsy) as a complication of tonsillitis. This will usually result in a hospital admission where an operation to drain the abscess may be necessary and high-dose parenteral antibiotics may be given.

Glandular fever (infectious mononucleosis) is one viral cause of sore throat that often produces marked discomfort and may cause dysphagia. If this is suspected, referral is necessary for an accurate diagnosis.

Most bad sore throats will cause discomfort on swallowing, but not true difficulty and do not necessarily need referral unless there are other reasons for concern. Dysphagia, when not associated with a sore throat, always needs referral (see p. 77).

Appearance of throat

It is commonly thought that the presence of white spots, exudates or pus on the tonsils is an indication for referral or a means of differentiating between viral and bacterial infection, but this is not always

so. Unfortunately, the appearance can be the same in both types of infection and sometimes the throat can appear almost normal without exudates in a streptococcal (bacterial) infection.

Thrush

An exception not to be forgotten is candidal (thrush) infection that produces white plaques. However, these are rarely confined to the throat alone and are most commonly seen in babies or the very elderly. It is an unusual infection in young adults and may be associated with more serious disorders that interfere with the body's immune system, for example, leukaemia, HIV and acquired immune deficiency syndrome (AIDS), or with immunosuppressive therapy (e.g. steroids). The plaques may be seen in the throat and on the gums and tongue. When they are scraped off, the surface is raw and inflamed. Referral is advised if thrush is suspected and the throat is sore and painful. See p. 199 for more information about oral thrush.

Glandular fever

Glandular fever is a viral throat infection caused by the Epstein–Barr virus. It is well known because of its tendency to leave its victims debilitated for some months afterwards and its association with the controversial condition myalgic encephalomyelitis. The infection typically occurs in teenagers and young adults, with peak incidence between the ages of 14 and 21 years. It is known as the 'kissing disease'. A severe sore throat may follow 1 or 2 weeks of general malaise. The throat may become very inflamed with creamy exudates present. There may be difficulty in swallowing because of the painful throat. Glands (lymph nodes) in the neck and axillae (armpits) may be enlarged and tender. The diagnosis can be confirmed with a blood test, although this may not become positive until 1 week after the onset of the illness. Antibiotics are of no value; in fact if *ampicillin* is given during the infection, a measles-type rash is likely to develop in 80% of those with glandular fever. Treatment is aimed at symptomatic relief.

When to refer

Sore throat lasting 1 week or more
Recurrent bouts of infection
Hoarseness of more than 3 weeks' duration
Difficulty in swallowing (dysphagia)
Failed medication

Treatment timescale

Patients should see their doctor after 1 week if the sore throat has not improved.

Management

Most sore throats are caused by viral infections and are self-limiting in nature, with 90% of patients becoming well within 1 week of the onset of symptoms. The pharmacist can offer a selection of treatments aimed at providing some relief from discomfort and pain until the infection subsides. Oral analgesics are first-line treatment. A systematic review found that simple analgesics *(paracetamol, aspirin* and *ibuprofen*) are very effective at reducing the pain from sore throat. Lozenges and pastilles have a soothing effect. There is some evidence that *benzydamine spray* is effective in relieving sore throat pain.

Oral analgesics

Paracetamol, aspirin and *ibuprofen* have been shown in clinical trials to provide rapid and effective relief of pain in sore throat. A systematic review showed no benefit of adding other analgesic constituents. The patient can be advised to take the analgesic regularly to sustain pain relief. (For a discussion of doses, side effects, cautions and contraindications for simple analgesics, see p. 199.) *Flurbiprofen lozenges* are licensed for sore throat in adults and children aged 12 years and over. They contain 8.75 mg of *flurbiprofen,* and one lozenge is sucked or dissolved in the mouth every 3–6 h as required, to a maximum of five lozenges. *Flurbiprofen lozenges* can be used for up to 3 days at a time.

Mouthwashes and sprays

Anti-inflammatory (e.g. benzydamine)

Benzydamine is an anti-inflammatory agent that is absorbed through the skin and mucosa and has been shown to be effective in reducing pain and inflammation in conditions of the mouth and throat. Side effects have occasionally been reported and include numbness and stinging of the mouth and throat. *Benzydamine spray* can be used in children of 6 years and over, whereas the mouthwash may only be recommended for children over 12 years of age.

Local anaesthetic (e.g. benzocaine)

Benzocaine and *lidocaine* are available in throat sprays.

Lozenges and pastilles

Lozenges and pastilles can be divided into three categories.

Antiseptic (e.g. *cetylpyridinium*)
Antifungal (e.g. *dequalinium*)
Local anaesthetic (e.g. *benzocaine*)

Lozenges and pastilles are commonly used OTC treatments for sore throats, and where viral infection is the cause, the main use of antibacterial and antifungal preparations is to soothe and moisten the throat. Lozenges containing *cetylpyridinium chloride* have been shown to have antibacterial action.

Local anaesthetic lozenges will numb the tongue and throat and can help to ease soreness and pain. *Benzocaine* can cause sensitisation and such reactions have sometimes been reported.

Caution: Iodised throat lozenges should be avoided in pregnancy because they have the potential to affect the thyroid gland of the fetus.

Practical points

Diabetes

Mouthwashes and gargles are suitable and can be recommended. Sugar-free pastilles are available but the sugar content of such products is not considered important in short-term use.

Mouthwashes and gargles

Patients should be reminded that mouthwashes and gargles should not be swallowed. The potential toxicity of OTC products of this type is low and it is unlikely that problems would result from swallowing small amounts. However, there is a small risk of systemic toxicity from swallowing products containing *iodine*. Manufacturers' recommendations about whether to use the mouthwash diluted or undiluted should be checked and appropriate advice should be given to the patient.

Sore throats in practice

Case 1

A woman asks your advice about her son's very sore throat. He is 15 years old and is at home in bed. She says he has a temperature and that she can see creamy white matter at the back of his throat. He seems lethargic and has not been eating very well because his throat has been so painful. The sore throat started about 5 days ago and he has been in bed since yesterday. The glands on his neck are swollen.

The pharmacist's view

It would be best for this woman's son to be seen by the doctor. The symptoms appear to be severe and he is ill enough to be in bed.

Glandular fever is common in this age group and is a possibility. In the meantime, you might consider recommending some *paracetamol* in soluble or syrup form to make it easier to swallow. The analgesic and antipyretic effects would both be useful in this case.

The doctor's view

The pharmacist is sensible in recommending referral. The description suggests a severe tonsillitis, which will be caused by either a bacterial or viral infection. If it turns out to be viral, then glandular fever is a strong possibility. The doctor should check out the ideas, concerns and expectations of the mother and son and then explain the likely causes and treatment. Often it is not possible to rule out a bacterial (streptococcal) infection at this stage and it is safest to prescribe oral *penicillin,* or *erythromycin* if the patient is allergic to *penicillin.* Depending on the availability of laboratory services, the doctor may take a throat swab, which would identify a bacterial infection. If the infection has gone on for nearly 1 week, then a blood test can identify infectious mononucleosis (glandular fever). Although there is no specific treatment for glandular fever, it is helpful for the patient to know what is going on and when to expect full recovery.

Case 2

A teenage girl comes into your shop with her mother. The girl has a sore throat which started yesterday. There is slight reddening of the throat. Her mother tells you she had a slight temperature during the night. She also has a blocked nose and has been feeling general aching. She has no difficulty in swallowing and is not taking any medicines, either prescribed or OTC.

The pharmacist's view

It sounds as though this girl has a minor URTI. The symptoms described should remit within a few days. In the meantime, it would be reasonable to recommend a systemic analgesic, perhaps in combination with a decongestant.

The doctor's view

The pharmacist's assessment sounds correct. Because she has a blocked nose, a viral infection is most likely. Many patients attend their doctor with similar symptoms understandably hoping for a quick cure with antibiotics that have no place in such infections.

Case 3

A middle-aged woman comes to ask your advice about her husband's bad throat. He has had a hoarse gruff voice for about 1 month and has tried various lozenges and pastilles without success. He has been

a heavy smoker (at least a pack a day) for over 20 years and works as a bus driver.

The pharmacist's view

This woman should be advised that her husband should see his doctor. The symptoms that have been described are not those of a minor throat infection. On the basis of the long duration of the problem and of the unsuccessful use of several OTC treatments, it would be best for this man to see his doctor for further investigation.

The doctor's view

A persistent alteration in voice, with hoarseness, is an indication for referral to an ENT specialist. This man should have his vocal cords examined, which requires skill and special equipment that most family doctors do not have. It is possible he may have a cancer on his vocal cords (larynx), especially as he is a smoker.

Allergic rhinitis (hay fever)

Seasonal allergic rhinitis (hay fever) affects 10–15% of people in the United Kingdom, and millions of patients rely on OTC medicines for treatment. The symptoms of allergic rhinitis occur after an inflammatory response involving the release of histamine, which is initiated by allergens being deposited on the nasal mucosa. Allergens responsible for seasonal allergic rhinitis include grass pollens, tree pollens and fungal mould spores. Perennial allergic rhinitis occurs when symptoms are present all year round and is commonly caused by the house dust mite, animal dander and feathers. Some patients may suffer from perennial rhinitis, which becomes worse in the summer months.

What you need to know

- Age (approximate)
  - Baby, child, adult
- Duration
- Symptoms
  - Rhinorrhoea (runny nose)
  - Nasal congestion
  - Nasal itching
  - Watery eyes
  - Irritant eyes
  - Discharge from the eyes
  - Sneezing
- Previous history
- Associated conditions
  - Eczema
  - Asthma
- Medication

Significance of questions and answers

Age

Symptoms of allergic rhinitis may start at any age, although its onset is more common in children and young adults (the condition is most

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common in those in their 20s and 30s). There is frequently a family history of atopy in allergic rhinitis sufferers. Thus, children of allergic rhinitis sufferers are more likely to have the condition. The condition often improves or resolves as the child gets older. The age of the patient must be taken into account if any medication is to be recommended. Young adults who may be taking examinations should be borne in mind, because treatment that may cause drowsiness is best avoided in these patients.

Duration

Sufferers will often present with seasonal rhinitis as soon as the pollen count becomes high. Symptoms may start in April when tree pollens appear and the hay fever season may start 1 month earlier in the south than in the north of England. Hay fever peaks between the months of May and July, when grass pollen levels are highest and spells of good weather commonly cause patients to seek the pharmacist's advice. Anyone presenting with a summer cold, perhaps of several weeks' duration, may be suffering from hay fever. Fungal spores are also a cause and are present slightly later, often until September.

People can suffer from what they think are mild cold symptoms for a long period, without knowing they have perennial rhinitis.

Allergic rhinitis can be classified as:

Intermittent. Occurs less than 4 days/week or for less than 4 weeks

Persistent. Occurs more than 4 days/week and for more than 4 weeks

Mild. All of the following – normal sleep, normal daily activities, sport, leisure, normal work and school, symptoms not troublesome

Moderate. One or more of the following – abnormal sleep; impairment of daily activities, sport, leisure, problems caused at work or school, troublesome symptoms

Symptoms

Rhinorrhoea

A runny nose is a commonly experienced symptom of allergic rhinitis. The discharge is often thin, clear and watery, but can change to a thicker, coloured, purulent one. This suggests a secondary infection, although the treatment for allergic rhinitis is not altered. There is no need for antibiotic treatment.

Nasal congestion

The inflammatory response caused by the allergen produces vasodilation of the nasal blood vessels and so results in nasal congestion. Severe congestion may result in headache and occasionally earache. Secondary infection such as otitis media and sinusitis can occur (see p. 21).

Nasal itching

Nasal itching commonly occurs. Irritation is sometimes experienced on the roof of the mouth.

Eye symptoms

The eyes may be itchy and also watery; it is thought these symptoms are a result of tear duct congestion and also a direct effect of pollen grains being caught in the eye, setting off a local inflammatory response. Irritation of the nose by pollen probably contributes to eye symptoms too. People who suffer severe symptoms of allergic rhinitis may be hypersensitive to bright light (photophobic) and find that wearing dark glasses is helpful.

Sneezing

In hay fever, the allergic response usually starts with symptoms of sneezing, then rhinorrhoea, progressing to nasal congestion. Classically, symptoms of hay fever are more severe in the morning and in the evening. This is because pollen rises during the day after being released in the morning and then settles at night. Patients may also describe a worsening of the condition on windy days as pollen is scattered, and a reduction in symptoms when it rains, or after rain, as the pollen clears. Conversely, in those allergic to fungal mould spores, the symptoms worsen in damp weather.

Previous history

There is commonly a history of hay fever going back over several years. However, it can occur at any age, so the absence of any previous history does not necessarily indicate that allergic rhinitis is not the problem. The incidence of hay fever has risen during the last decade. Pollution, particularly in urban areas, is thought to be at least partly responsible for the trend.

Perennial rhinitis can usually be distinguished from seasonal rhinitis by questioning about the timing and the occurrence of symptoms. People who have had hay fever before will often consult the pharmacist when symptoms are exacerbated in the summer months.

Danger symptoms/associated conditions

When associated symptoms such as tightness of the chest, wheezing, shortness of breath or coughing are present, immediate referral is advised. These symptoms may herald the onset of an asthmatic attack.

Wheezing

Difficulty with breathing, possibly with a cough, suggests an asthmatic attack. Some sufferers experience asthma attacks only during the hay fever season (seasonal asthma). These episodes can be quite severe and

require referral. Seasonal asthmatics often do not have appropriate medication at hand as their attacks occur so infrequently, which puts them at greater risk.

Earache and facial pain

As with colds and flu (see p. 21), allergic rhinitis can be complicated by secondary bacterial infection in the middle ear (otitis media) or the sinuses (sinusitis). Both these conditions cause persisting severe pain.

Purulent conjunctivitis

Irritated watery eyes are a common accompaniment to allergic rhinitis. Occasionally, this allergic conjunctivitis is complicated by a secondary infection. When this occurs, the eyes become more painful (gritty sensation) and redder, and the discharge changes from being clear and watery to coloured and sticky (purulent). A referral is needed.

Medication

The pharmacist must establish whether any prescription or OTC medicines are being taken by the patient. Potential interactions between prescribed medication and antihistamines can therefore be identified.

It would be useful to know if any medicines have been tried already to treat the symptoms, especially where there is a previous history of allergic rhinitis. In particular, the pharmacist should be aware of the potentiation of drowsiness by some antihistamines combined with other medicines. This can lead to increased danger in certain occupations and driving.

Failed medication

If symptoms are not adequately controlled with OTC preparations, an appointment with the doctor may be worthwhile. Such an appointment is useful to explore the patient's beliefs and pre-conceptions about hay fever and its management. It is also an opportunity to suggest ideas for the next season.

When to refer

Wheezing and shortness of breath
Tightness of chest
Painful ear
Painful sinuses
Purulent conjunctivitis
Failed medication

Treatment timescale

Improvement in symptoms should occur within a few days. If no improvement is noted after 5 days, the patient might be referred to the doctor for other therapy.

Management

Management is based on whether symptoms are intermittent or persistent and mild or moderate. Options include antihistamines, nasal steroids and *sodium cromoglicate* (*sodium cromoglycate*) in formulations for the nose and eyes. OTC antihistamines and steroid nasal sprays are effective in the treatment of allergic rhinitis. The choice of treatment should be rational and based on the patient's symptoms and previous history where relevant.

Many cases of hay fever can be managed with OTC treatment and it is reasonable for the pharmacist to recommend treatment. Patients with symptoms that do not respond to OTC products can be referred to the doctor at a later stage. Pharmacists also have an important role in ensuring that patients know how to use any prescribed medicines correctly (e.g. steroid nasal sprays, which must be used continuously for the patient to benefit).

Antihistamines

Many pharmacists would consider these drugs to be the first-line treatment for mild-to-moderate and intermittent symptoms of allergic rhinitis. They are effective in reducing sneezing and rhinorrhoea, less so in reducing nasal congestion. Non-sedating antihistamines available OTC include *acrivastine, cetirizine* and *loratadine.* All are effective in reducing the troublesome symptoms of hay fever and have the advantage of causing less sedation than some of the older antihistamines.

Cetirizine and *loratadine* are taken once daily, while *acrivastine* is taken three times daily. For sale OTC loratadine can be recommended for children over 2 years, cetirizine over 6 years and acrivastine over 12 years.

While drowsiness is an unlikely side effect of any of the three drugs, patients might be well advised to try the treatment for a day before driving or operating machinery. *Loratadine* may be less likely to have any sedative effect than the other two, but the incidence of drowsiness is extremely small.

Acrivastine, cetirizine and *loratadine* may be used for other allergic skin disorders such as perennial rhinitis and urticaria.

Older antihistamines such as *promethazine* and *diphenhydramine* have a greater tendency to produce sedative effects. Indeed, both drugs are available in the United Kingdom among OTC products promoted

for the management of temporary sleep disorders (see p. 329). The shorter half-life of *diphenhydramine* (5–8 h compared with 8–12 h of *promethazine*) should mean less likelihood of a morning hangover/drowsiness effect.

Other older antihistamines are relatively less sedative, such as *chlorphenamine* (*chlorpheniramine*). Patients may develop tolerance to their sedation effects. Anticholinergic activity is very much lower among the newer drugs compared to the older drugs.

Interactions: The potential sedative effects of older antihistamines are increased by alcohol, hypnotics, sedatives and anxiolytics. The alcohol content of some OTC medicines should be remembered.

The plasma concentration of non-sedating antihistamines may be increased by *ritonavir;* plasma concentration of *loratadine* may be increased by *amprenavir* and *cimetidine*. There is a theoretical possibility that antihistamines can antagonise the effects of *betahistine*.

Side effects: The major side effect of the older antihistamines is their potential to cause drowsiness. Their anticholinergic activity may result in a dry mouth, blurred vision, constipation and urinary retention. These effects will be increased if the patient is already taking another drug with anticholinergic effects (e.g. tricyclic antidepressants, neuroleptics).

At very high doses, antihistamines have CNS excitatory effects rather than depressive effects. Such effects seem to be more likely to occur in children. At toxic levels, there have been reports of fits being induced. As a result, it has been suggested that antihistamines should be used with care in epileptic patients. However, this appears to be a largely theoretical risk.

Antihistamines are best avoided by patients with narrow- (closed-) angle glaucoma, since the anticholinergic effects produced can cause an increase in intraocular pressure. They should be used with caution in patients with liver disease or prostatic hypertrophy.

Decongestants

Oral or topical decongestants may be used short term to reduce nasal congestion alone or in combination with an antihistamine. They can be useful in patients starting to use a preventer such as a nasal corticosteroid (e.g. *beclometasone*) or *sodium cromoglicate* where congestion can prevent the drug from reaching the nasal mucosa. Topical decongestants can cause rebound congestion, especially with prolonged use. They should not be used for more than 1 week. Oral decongestants are occasionally included such as *pseudoephedrine*. Their use, interactions and adverse effects are considered in the section on 'Colds and flu' (see pp. 24–25).

Eye drops containing an antihistamine and sympathomimetic combination are available and may be of value in troublesome eye symptoms,

particularly when symptoms are intermittent. The sympathomimetic acts as a vasoconstrictor, reducing irritation and redness. Some patients find that the vasoconstrictor causes painful stinging when first applied. Eye drops that contain a vasoconstrictor should not be used in patients who have glaucoma or who wear soft contact lenses.

Steroid nasal sprays

Beclometasone nasal spray (aqueous pump rather than aerosol version) and *fluticasone metered nasal spray* can be used for the treatment of seasonal allergic rhinitis.

A steroid nasal spray is the treatment of choice for moderate–to-severe nasal symptoms that are continuous. The steroid acts to reduce inflammation that has occurred as a result of the allergen's action. Regular use is essential for full benefit to be obtained and treatment should be continued throughout the hay fever season. If symptoms of hay fever are already present, the patient needs to know that it is likely to take several days before the full treatment effect is reached.

Dryness and irritation of the nose and throat as well as nosebleeds have occasionally been reported; otherwise side effects are rare. *Beclometasone* and *fluticasone nasal sprays* can be used in patients over 18 years of age for up to 3 months. They should not be recommended for pregnant women or for anyone with glaucoma.

Patients are sometimes alarmed by the term 'steroid', associating it with potent oral steroids and possible side effects. Therefore, the pharmacist needs to take account of these concerns in explanations about the drug and how it works.

Sodium cromoglicate

Sodium cromoglicate is available OTC as nasal drops or sprays and as eye drops. *Cromoglicate* can be effective as a prophylactic if used correctly. It should be started at least 1 week before the hay fever season is likely to begin and then used continuously. There seem to be no significant side effects, although nasal irritation may occasionally occur.

Cromoglicate eye drops are effective for the treatment of eye symptoms that are not controlled by antihistamines. *Cromoglicate* should be used continuously to obtain full benefit. The eye drops should be used four times a day. The eye drops contain the preservative *benzalkonium chloride* and should not be used by wearers of soft contact lenses.

Topical antihistamines

Nasal treatments

Azelastine is a nasal spray used in allergic rhinitis. The *BNF* suggests that treatment should begin 2–3 weeks before the start of the hay fever

season. Its place in treatment is likely to be for mild and intermittent symptoms in adults and children over 5 years. Advise the patient to keep the head upright during use to prevent the liquid trickling into the throat and causing an unpleasant taste.

Further advice

1 Car windows and air vents should be kept closed while driving. Otherwise a high pollen concentration inside the car can result.

2 Where house dust mite is identified as a problem, regular cleaning of the house to maintain dust levels at a minimum can help. Special vacuum cleaners are now on sale that are claimed to be particularly effective.

Hay fever in practice

Case 1

A young man presents in late May. He asks what you can recommend for hay fever. On questioning, he tells you that he has not had hay fever before, but some of his friends got it and he thinks he has the same thing. His eyes have been itching a little and are slightly watery, and he has been sneezing for a few days. His nose has been runny and now feels quite blocked. He will not be driving. But he is a student at the local sixth-form college and has exams coming up next week. He is not taking any medicines.

The pharmacist's view

This young man is experiencing the classic symptoms of hay fever for the first time. The nasal symptoms are causing the most discomfort; he has had rhinorrhoea and now has congestion, so it would be reasonable to recommend a corticosteroid nasal spray, provided he is aged 18 years or over. If he is under 18 years, an oral or topical antihistamine could be recommended, bearing in mind that he is sitting for exams soon and so any preparation that might cause drowsiness is best avoided. His eyes are slightly irritated, but the symptoms are not very troublesome. You know that he is not taking any other medicines, so you could recommend *acrivastine, loratadine* or *cetirizine*. If the symptoms are not better in a few days, he should see the doctor.

The doctor's view

A corticosteroid nasal spray is likely to be more effective. If he cannot use the OTC product because he is under 18 years, *acrivastine, loratadine* or *cetirizine* would be worth a try. Even though they are generally non-sedating, they can cause drowsiness in some patients. The student should be advised not to take his first dose just before the exam. If his symptoms do not settle, then referral is appropriate. He may benefit

from *sodium cromoglicate eye drops* if his eye symptoms are not fully controlled by the antihistamine. It is often worthwhile trying an older antihistamine as an alternative because some people are unaffected by the sedative properties.

Case 2

A woman in her early thirties wants some advice. She tells you that she has hay fever and a blocked nose and is finding it difficult to breathe. You find out that she has had the symptoms for a few days; they have gradually got worse. She gets hay fever every summer and it is usually controlled by *chlorphenamine* tablets that she buys every year and which she is taking at the moment. As a child, she suffered quite badly from eczema and is still troubled by it occasionally. She tells you that she has been a little wheezy for the past day or so, but she does not have a cough, and has not coughed up any sputum. She is not taking any other medicines.

The pharmacist's view

This woman has a previous history of hay fever, which has, until now, been dealt adequately with *chlorphenamine* tablets. Her symptoms have worsened over a period of a few days and she is now wheezing. It seems unlikely that she has a chest infection, which could have been a possible cause of the symptoms. She should be referred to the doctor at once since her symptoms suggest more serious implications such as asthma.

The doctor's view

This woman should be referred to her doctor directly. She almost certainly has seasonal asthma. In addition to the hay fever treatment recommended by her pharmacist, it is likely that she would benefit from a steroid inhaler such as *beclometasone*. Depending on the severity of her symptoms, she would probably be prescribed a beta-agonist, such as a *salbutamol inhaler,* as well. This consultation is a complex one for a doctor to manage in the usual 10 min available in view of the time required for information-giving, explanation about the nature of the problem, the rationale for the treatments and the technique of using inhalers.

Respiratory symptoms for direct referral

Chest pain

Respiratory causes

A knifelike pain is characteristic of pleurisy. It is a localised pain which is aggravated by taking a breath or coughing. It is usually caused by a respiratory infection and may be associated with an underlying pneumonia. Less commonly, it may be caused by a pulmonary embolus (a blood clot which has lodged in a pulmonary artery after separating from a clot elsewhere in the circulation).

A pain similar to that experienced with pleurisy may arise from straining the muscles between the ribs following coughing. It may also occur with cracked or fractured ribs following injury or violent coughing. Another less common cause of pain is due to a pneumothorax where a small leak develops in the lung causing its collapse.

The upper front part of the chest may be very sore in the early stages of acute viral infections that cause inflammation of the trachea (tracheitis). Viral flu-like infections can be associated with non-specific muscular pain (myalgia).

Non-respiratory causes

Heartburn

Heartburn occurs when the acid contents of the stomach leak backwards into the oesophagus (gullet). The pain is described as a burning sensation, which spreads upwards towards the throat. Occasionally, it can be so severe as to mimic cardiac pain.

Cardiac pain

Cardiac pain typically presents as a tight, gripping, vicelike, dull pain that is felt centrally across the front of the chest. The pain may seem to move down one or both arms. Sometimes the pain spreads to the neck. When angina is present, the pain is brought on by exercise and relieved by rest. When a coronary event such as a heart attack (myocardial infarction) occurs, the pain is similar but more severe and prolonged. It may come on at rest.

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Anxiety

Anxiety is a commonly seen cause of chest pain in general practice. The pain probably arises as a result of hyperventilation. Diagnosis can be difficult as the hyperventilation may not be obvious.

Shortness of breath

Shortness of breath may be a symptom of a cardiac or respiratory disorder. Differential diagnosis can be difficult. It is usually a sign of a serious condition, although it can be due to anxiety.

Respiratory causes

Asthma

Occasionally, asthma may develop in later life, but it is most commonly seen in young children or young adults. The breathlessness is typically associated with a wheeze, although in mild cases the only symptom may be a recurrent nocturnal cough. Most asthmatics have normal breathing between attacks. The attacks are often precipitated by viral infections such as colds. Some are worsened in the hay fever season, others by animal fur or dust. The breathlessness is often worse at night.

Chronic bronchitis and emphysema (COPD)

Chronic bronchitis and emphysema are usually caused by cigarette smoking and give rise to permanent breathlessness, especially on exertion, with a productive cough. The breathing worsens when an infective episode develops. At such times there is also an increase in coloured sputum production.

Cardiac causes

Heart failure

Heart failure may develop gradually or present acutely as an emergency (usually in the middle of the night). The former (congestive cardiac failure) may cause breathlessness on exertion. It is often associated with ankle swelling (oedema) and is most common in the elderly. The more sudden type is called acute left ventricular failure. The victim is woken by severe breathlessness and has to sit upright. There is often a cough present with clear frothy sputum.

Other causes

Hyperventilation syndrome

Hyperventilation syndrome occurs when the rate of breathing is too high for the bodily requirements. Paradoxically, the subjective experience is that of breathlessness. The sufferer complains of difficulty in taking in a deep breath. The experience is frightening but harmless. It may be associated with other symptoms such as tingling in the hands

and feet, numbness around the mouth, dizziness and various muscular aches. It may be caused by anxiety.

Wheezing

Wheezing sounds may be heard in the throat region in URTIs and are of little consequence. They are to be differentiated from wheezing emanating from the lungs. In this latter situation, there is usually some difficulty in breathing.

Wheezy bronchitis

Wheezing occurs in infants with wheezy bronchitis. It is caused by a viral infection and is completely different from chronic bronchitis seen in adults. The infection is self-limiting but requires accurate diagnosis. It may be confused with croup (laryngotracheitis) or bronchiolitis. Children who have a history of recurrent wheezy bronchitis are more likely to develop asthma.

Asthma

Wheezing is a common feature of asthma and accompanies the shortness of breath. However, in very mild asthma it is not obvious and may present with just a cough. At the other extreme, an asthma attack can be so severe that so little air moves in and out of the lungs, there is no audible wheeze.

Cardiac

Wheezing may be a symptom associated with shortness of breath in heart failure.

Sputum

Sputum may be described as thick or thin and clear or coloured. It is a substance coughed up from the lungs and is not to be confused with saliva or nasal secretions.

Bronchitis

Clear, thick sputum may be coughed up in chronic bronchitis or by regular cigarette smokers. It has a mucoid nature and may be described as white, grey or clear with black particles. Chronic bronchitics are prone to recurrent infective exacerbations during which sputum production increases and turns yellow or green.

Pneumonia

Coloured mucoid sputum may be present in other lung infections such as pneumonia. Rust-coloured sputum is a characteristic of

pneumococcal (lobar) pneumonia. Usually it is associated with a high fever and sweats.

Cardiac

Clear, thin (serous) sputum may be a feature of heart failure (left ventricular failure). The sputum forms as a result of pulmonary oedema, which characteristically awakens the patient in the night with shortness of breath.

Haemoptysis

The presence of blood in sputum is always alarming. Small traces of blood can result from a broken capillary caused by coughing and is harmless. However, it can be a symptom of serious disease such as lung cancer or pulmonary TB, and should always be referred for further investigation. Occasionally, blood is coughed up after a nosebleed and is of no consequence.