Respiratory Disorders I

Colds and flu

The common cold comprises a mixture of viral upper respiratory tract infections (URTIs). More than 200 different virus types can produce symptoms of the common cold, including rhinoviruses (accounting for 30-50% of all cases), coronaviruses, parainfluenza virus and others. 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.

Patient Assessment with cold (Questions to be asked):

A- Age

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

B- 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. 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.

C- 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, which 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.

Sneezing/coughing

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

Sore throat

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

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. People with flu often report muscular and joint aches and this is more likely to occur with flu than with the common cold.

Low grade fever

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.

Earache

Earache is a common complication of colds, especially in children. Sometimes the situation worsens when the middle ear fills up with fluid (Under normal circumstances, the middle ear is an air-containing compartment). 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. In about 80% of children, AOM will resolve spontaneously in about 3 days without antibiotics.

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 Dr would be advisable

Flu Vs. cold

Differentiating between colds and flu may be needed to make a decision about whether referral is needed. Flu is generally considered to be likely if:

- Temperature is 38◦ C or higher (37.5◦C in the elderly);
- One or more respiratory symptom – cough, sore throat, nasal congestion or rhinorrhoea – is present; or
- One or more constitutional symptom – headache, malaise, myalgia, sweats/chills, and 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. Flu can be complicated by secondary lung infection (pneumonia).

Previous history

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.
Chronic lung disease e.g. chronic bronchitis (which can be complicated by secondary chest infection) required referral for further investigations

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.

CASES NEED REFERAL

Earache not settling with analgesic
In the very young
In the very old
In those with heart or lung disease, e.g. 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 for cold and flu

General notes:

- stay away from people with colds or influenza.
- Avoid crowded places where the risk of infection is greater.
- Do not touch nose or eyes after being in physical contact with somebody who has a cold.
- Wash hands thoroughly, especially after blowing the nose.

- Throw away paper tissues after use to prevent the spread of infection.
- Keep rooms well aired.
- Antibacterials are not effective or appropriate as both infections are viral. Patients with suspected secondary bacterial infection should be referred to a doctor
- The use of OTC medicines in the treatment of colds and flu is widespread, 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.

Pharmacological Therapy

A- 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.

Notes

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.

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.

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 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.
The interaction between sympathomimetics and 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, avoid both oral and topical sympathomimetics.

B- Antihistamines

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, 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 or to help the patient to sleep (included in combination products intended to be taken at night).

Evidence indicates that anti-histamines alone are not of benefit in the common cold but that they may offer limited benefit for adults and children in combination with decongestants, analgesics and cough suppressants.

C- Cough remedies

D- Analgesics

E- Products for sore throats

F- Vitamin C

Vitamin C does not prevent colds and even high-dose vitamin C (over 1 g/day) produce minimum benefits.

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. Manufacturers of paediatric drops advise consultation with the doctor for children under 2 years.

Prevention of flu

Pharmacists should encourage those in at-risk groups to have an annual flu vaccination. In the UK, 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.

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. They will often be associated with other symptoms of a cold.

Patient Assessment with cold (Questions to be asked):

A- Age

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

B- 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.

C- Types of cough

1-Productive (wet, chesty) cough: 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 usually 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.

2- Unproductive (dry, tickly or tight): no sputum is produced. These coughs are usually caused by viral infection and are self-limiting.

3- Chesty-Nonproductive: where there is congestion on the chest but no mucus is produced, and this should be treated as a productive cough rather than non-productive.

D- Associated Symptoms with previous history:

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

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

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

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

4- 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.

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

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

6- Whooping cough (pertussis)

Whooping cough starts with catarrhal symptoms-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.

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

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

E- 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, e.g. 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 (ACE) inhibitors

Chronic coughing may occur in patients, particularly women, taking ACE inhibitors such as *enalapril*, *captopril*, *lisinopril* and *ramipril*.

When to refer:

Cough lasting 2 weeks or more and not improving
Sputum (yellow, green, rusty or blood-stained)
Chest pain
Shortness of breath
Wheezing
Whooping cough or croup
Recurrent nocturnal cough
Suspected adverse drug reaction
Failed medication

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

A- Demulcents

Preparations such as *glycerin*, *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 2.

B- Antitussive (Cough Suppressants):

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. *Pholcodine* can be given at a dose of 5 mg to children over 2 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 2 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.

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, when the combination is given as a night-time dose if the cough is disturbing sleep, a good night's sleep will invariably follow. 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.

C- Expectorants and Mucolytics:

Both are used for wet cough, Mucolytics can dissolves thick mucus and are usually used to help relieve respiratory difficulties. Expectorants reduce the thickness or viscosity of bronchial secretions thus increasing mucus flow that can be removed more easily through coughing.

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.

Bromhexine*:*

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

D- Additional Constituents

Sympathomimetics

Pseudoephedrine is used in cough and cold remedies 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.

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, e.g. *cimetidine* and *erythromycin*.

References:

1. Symptoms in the Pharmacy 7th Edition, 2014.
2. Community Pharmacy a guide to managment of minor ailements 1st Edition, 2018.