## Module 1913

# Pneumonia: causes, symptoms and management

From this pharmacy CPD module you will learn about:

- Causes and symptoms of pneumonia and who is most likely to be affected
- Diagnosis, management and complications of the condition
- Prevention strategies
- Advice pharmacy teams can offer patients to aid recovery

most commonly caused by the respiratory syncytial virus or influenza type A or B. Cases are usually mild, but can sometimes be severe.

#### Fungal pneumonia

This is rare in the UK, but more likely to affect those with a weakened immune system or chronic health condition. The fungi that cause fungal pneumonia can be found in soil or bird droppings.

#### Mycoplasma pneumoniae

This atypical pneumonia occurs in outbreaks approximately every four years in the UK, and is much more common in school-age children and young adults. Symptoms are usually milder than other types of pneumonia.

#### NAIMAH CALLACHAND, PHARMACIST

Pneumonia is an infection of the lung tissue in which the air sacs (or alveoli) become inflamed in either one or both lungs. The sacs then become filled with fluid, making it more difficult to breathe.

Pneumonia can vary in severity from mild to life-threatening, and pharmacists therefore play a key role in ensuring patients receive the right care for their symptoms.

#### What causes pneumonia?

Pneumonia is classified by the pathogen that causes the infection and where it is acquired. Community-acquired pneumonia (CAP) is the most common type and is an infection that occurs in the community, outside of a hospital or other healthcare facility setting. Worldwide, CAP is most commonly caused by the bacteria *Streptococcus pneumoniae*. Other bacteria that may cause CAP include *Haemophilus influenzae* and *Staphylococcus aureus*.

Other causes of pneumonia include:

#### Viral pneumonia

Viruses are the most common cause of pneumonia in those under five years old. It is



#### Aspiration pneumonia

This is caused by inhaling a foreign object into the lungs, such as food, drink or vomit, or breathing in a harmful substance, such as smoke or chemicals.

#### Hospital-acquired pneumonia

This is pneumonia that develops in hospital, while being treated for another condition or having an operation. Those in intensive care, who are using ventilators, are at particular risk of developing ventilator-associated pneumonia.

#### **Prevalence of pneumonia**

Pneumonia occurs most commonly in autumn and winter and it is estimated that in the UK, between five and 10 per 1,000 adults are affected each year. The incidence of pneumonia is often higher in older people. CAP accounts for 5% to 12% of all lower respiratory tract infections managed by GPs in the community and the rate of hospital admissions among patients with CAP is estimated to be between 22% and 42% each year.

Some people are at higher risk of pneumonia than others, including:

- babies and young children
- people aged over 65 years
- people with long-term diseases, such as heart, lung or kidney disease, or diabetes
- people undergoing chemotherapy or taking medication that suppresses the immune system
- smokers or individuals who drink excessive amounts of alcohol
- people who are immunocompromised, who have had a recent organ transplant or have an underlying health condition
- people who are hospitalised especially those who are on mechanical ventilators, have taken antibiotics recently or are immunocompromised.

#### Symptoms of pneumonia

In mild cases of pneumonia, GPs may listen to the patient's chest to check for any cracking or rattling sounds Symptoms can develop slowly over a few days

or more rapidly over 24-48 hours. The most common symptoms of pneumonia include:

- cough which can either be dry or productive, bringing up yellow, green, brown or bloodstained mucus
- difficulty breathing breathing may be rapid and shallow, and feeling out of breath can occur even when resting
- rapid heartbeat
- fever can be accompanied by sweating or shivering
- feeling generally unwell
- loss of appetite
- chest pain or discomfort that can worsen when breathing or coughing.

Less common symptoms include: haemoptysis (coughing up blood); headaches; fatigue; nausea or vomiting; wheezing; joint and muscle pain, and confusion (especially in elderly people).

If a patient is feeling unwell and has symptoms of pneumonia, they should be referred to their GP. Urgent medical attention should be sought if a patient is experiencing severe symptoms, such as rapid breathing, haemoptysis, chest pain or confusion.

#### **Differential diagnosis**

It can often be difficult to diagnose pneumonia, as symptoms may be similar to other conditions, such as asthma, bronchitis, acute exacerbations of chronic obstructive pulmonary disease (COPD), pulmonary embolism, lung malignancy or heart failure.

These conditions can have symptoms of breathlessness and wheeze. However, in asthma, a patient's symptoms are often worse at night, in the morning, with exercise or on exposure to allergens. COPD patients can produce purulent sputum and the chest may be hyperinflated, while with heart failure, symptoms are often worse when lying flat and patients often have a history of ischaemic heart disease. Lung malignancy can be suspected if the



Hospital-acquired pneumonia develops while being treated for another condition or after an operation



Conditions with similar symptoms, such as COPD, can make it more difficult to diagnose pneumonia

patient is a smoker and if they have symptoms of haemoptysis, and persistent chest and/ or shoulder pain. Alternatively, pulmonary embolism is suggested if breathlessness is acute-onset and there are symptoms of lung pain, haemoptysis and sinus tachycardia.

#### Diagnosis

Pneumonia should be diagnosed by a GP. In mild cases of pneumonia, they may ask about symptoms, take the patient's temperature and listen to the patient's chest to check for any cracking or rattling sounds. The GP may also tap the chest to help determine if the lungs are filled with fluid.

In more severe cases or if symptoms have not improved within 48 hours of starting treatment, further tests may be needed including:

 pulse oximetry test – to measure oxygen levels in the blood; if oxygen saturation levels are <94%, the patient should be urgently admitted to hospital

- blood tests these can help to confirm an infection and identify the causative organism
- chest x-ray this can help to confirm the diagnosis and determine the extent and location of infection
- sputum test analysing a sample of fluid from the lungs (sputum), taken after a deep cough, can help to pinpoint the cause of infection. Elderly patients with CAP can often present with non-specific symptoms and are less likely to present with symptoms such as fever, as may be seen in younger patients.

#### Complications

Some patients, especially those in high-risk groups, may develop complications. Pneumonia can result in worsening of chronic conditions, such as COPD or congestive heart failure. Complications can include:

• fluid accumulation between the covering of the lungs and inner lining of the chest, known as pleural effusion

- abscess in the lung
- bacteraemia this occurs when the infection spreads from the lungs to the bloodstream.
  It is a serious complication, which can spread quickly to other organs
- cardiovascular events those with pneumonia may be at increased risk of having cardiovascular complications, such as a heart attack.

Most people can completely recover from pneumonia; however, in some cases the infection can be fatal. The risk of death with pneumonia is higher in those patients who are hospitalised, especially those who have been admitted to intensive care. Due to possible severe complications of pneumonia, it is important to seek medical attention as soon as possible.

#### Treatment

Mild cases of pneumonia can usually be treated at home, with patients usually offered a five-day course of amoxicillin. An alternative antibiotic – such as a macrolide or tetracycline – should be offered to penicillin-allergic patients.

Patients should be advised to get plenty of rest and drink plenty of fluids. Those who do not respond to treatment after three days may need to receive a longer course of treatment or try a different antibiotic.

Symptoms may not improve if the bacteria causing the infection is resistant to the antibiotics that have been prescribed or if a virus is causing the infection.

More severe cases of pneumonia may require hospitalisation for treatment and antibiotics should be offered as soon as possible after diagnosis. Treatment is usually with two antibiotics at a time and the course is usually longer – for seven to 10 days – although patients may not need to stay in hospital the whole time.

After starting antibiotic therapy, patients should notice an improvement in symptoms, and the time this will take depends on how severe the pneumonia infection is.



Patients should quit smoking, to prevent further damage to the lungs and reduce the risk of infection

Generally:

- after one week, fever should be gone
- after four weeks, chest pain should have improved, and mucus production decreased
- after six weeks, coughing will have reduced and it should be easier to breathe
- after three months, most symptoms may be gone, but fatigue may still be present
- after six months, most people will feel back to normal.

You should refer a patient back to their doctor if they suspect symptoms are becoming worse or they have not improved.

#### **Pharmacy advice**

Mild infections can be managed at home. To help reduce symptoms of pain and fever, you can advise pain relief medication, such as paracetamol or ibuprofen, unless contraindicated. Ibuprofen should not be recommended to patients who have an allergy to aspirin or non-steroidal anti-inflammatory drugs or if the patient has asthma, kidney disease or a history of stomach ulcers.

To help ease symptoms of cough, you can recommend warm honey and lemon drinks. Cough medicines are not recommended and there is little evidence of their effectiveness.

Patients should be advised to drink plenty of fluids to avoid dehydration and to get plenty of rest. You should also counsel that it may take some weeks before they are feeling back to normal again after the infection has cleared.

#### Prevention of pneumonia

Although most cases of pneumonia are bacterial and are not passed on between people, it is important to give patients advice on measures they can take to reduce their risk of developing the condition. You can advise on practising good hygiene to help reduce the spread of common winter infections, which can increase the risk of developing pneumonia. You should recommend washing hands regularly with soap and water and to use a tissue when coughing or sneezing, which should then be thrown into the bin straight away.

You can also provide healthy lifestyle advice. For those patients who smoke, advice and support should be given on smoking cessation, as smoking can further damage the lungs and increases the risk of infection. People who drink alcohol excessively may be at increased risk of pneumonia, so it is important to counsel them on drinking in moderation or refer them to their GP if they drink heavily and need further support.

It is usually safe for someone with pneumonia to be around others, including family members. However, patients in at-risk groups may be less able to fight off infections and should be advised to avoid close contact with these people.

Advice should be given on vaccination against pneumonia, particularly for those patients in at-risk groups. There are two types of vaccines available that can protect against pneumonia:

- The pneumococcal polysaccharide vaccine (PPV) is for those at high risk of developing pneumococcal infection, including those over 65 years of age or in at-risk groups aged two years and over
- The pneumococcal conjugate vaccine (PCV) should be offered to all infants at two months of age as part of the immunisation schedule: a second dose is given at four months of age and a third at 12-13 months of age.
  High-risk groups should also be advised to

have the flu vaccine, which may help reduce the risk of developing pneumonia.

If patients require further information, they can be signposted to the British Lung Foundation website, which contains printable information leaflets about pneumonia, including information about what it is, who is at risk and how it can be treated.

### Pneumonia CPD - planned learning

#### What are you planning to learn?

I want to learn more about the causes and symptoms of pneumonia and who is most likely to be affected. I want to learn about the diagnosis, management and complications of the condition, as well as strategies for its prevention. I also want to improve my knowledge of the advice pharmacy teams can offer patients with pneumonia to help them recover.

This learning will help me to improve my knowledge of pneumonia, to be able to confidently provide advice to patients and carers, to spot at-risk patients and know when to refer.

#### How are you planning to learn it?

- I plan to read more about pneumonia on the Patient website at *tinyurl.com/pneumonia11*.
- I plan to improve my knowledge of the pneumococcal vaccines available on the NHS website at *tinyurl.com/pneumonia12*.
- I plan to find out about sources of information for patients asking about pneumonia, such as on the British Lung Foundation website at *tinyurl.com/pneumonia13*.

#### Give an example of how this learning has benefited the people using your services

An elderly patient came into the pharmacy asking for some information about pneumonia. Her sister had been diagnosed with the condition and was being treated at home with antibiotics and pain relief. She was particularly worried about catching it herself and for her other sister who was having treatment for breast cancer. I was able to explain about the risks of getting pneumonia and give advice about good hygiene and healthy lifestyle practices. I also gave her some links to online information.

## Take the 5-minute test online

 Community-acquired pneumonia is most commonly caused by *Streptococcus* pneumoniae.

True or false

- Viruses are the most common cause of pneumonia in those aged over 75 years. True or false
- The symptoms of pneumonia caused by bacteria-like organisms such as *Mycoplasma pneumoniae* are usually more severe than other types.
  True or false

4. In the UK it is estimated that between 15 and 20 per 1,000 adults have pneumonia each year.

True or false

 The most common symptoms of pneumonia include cough, difficulty breathing, fever, rapid heartbeat and loss of appetite.
True or false

- Complications of pneumonia include pleural effusion, lung abscess, bacteraemia and cardiovascular events.
  True or false
- Mild cases of pneumonia can usually be treated at home with a five-day course of amoxicillin.

#### True or false

- For most patients, all symptoms should be resolved, except perhaps for fatigue, three weeks after treatment with antibiotics.
  True or false
- Cough medicines are not recommended for the management of pneumonia, as there is little evidence of their effectiveness. True or false
- The pneumococcal polysaccharide vaccine (PPV) is given to all infants at two months of age as part of the immunisation schedule. True or false

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