Managing pneumonia in primary care

Assoc Prof Philip Eng

Assoc Prof Philip Eng, senior consultant respiratory physician at Mt Elizabeth Hospital in Singapore, shares his insights with Pearl Toh on diagnosing and managing pneumonia in the primary care setting.

Pneumonia is the second commonest cause of death in Singapore and most developed countries, accounting for 20 percent of all deaths in Singapore in 2017. The commonest cause of death is cancer and the third is ischaemic heart disease. Bacteria, viruses, and fungi infections can all cause pneumonia.

Diagnosing pneumonia

The main symptoms to look out for are cough and fever. Occasionally, there is pleuritic chest pain and shortness of breath. If the sputum is purulent (dark with either a yellow or green tinge), it often points to a bacterial aetiology while mucoid sputum (white and frothy) or an unproductive cough suggest a viral aetiology or an atypical pneumonia.

However, this rule does not always hold true. On physical examination, signs to look out for include fever, tachycardia, tachypnoea, and an abnormal chest auscultation. Specifically, listen out for crepitations and rhonchi. If pneumonia is suspected, the usual test to do is a chest X-ray to confirm the diagnosis of pneumonia.

Challenges

The main challenge for a GP is to differentiate an upper respiratory tract infection from a lower respiratory tract infection. Taking careful note of the patient's history is important to help differentiate between the two conditions.

Most upper respiratory tract infections are innocuous and resolve in a few days and do not require antibiotics as they are usually due to viruses. Upper respiratory tract infections usually do not result in severe sequelae like hospitalization or death. In contrast, lower tract infections such as pneumonia may have a potential to cause death or hospitalization.

The second tip is to examine the chest carefully through auscultation. If a lower respiratory tract infection is suspected, one should order a chest X-ray (posteroanterior [PA] and left lateral) to confirm the diagnosis of pneumonia. The left lateral is often forgotten but it gives valuable information of the left lower lobe which is shielded by the heart during a conventional PA chest X-ray.

Another tip is to pay attention to red flags in the patient's history, eg, hemoptysis, weight loss or prolonged cough (>3 weeks). Any patient who coughs for more than 3 weeks should have a chest X-ray to rule out anything sinister. The list of differential diagnoses of pneumonia are wide and commonly include lung cancer, lymphoma, acute pulmonary embolism, and bronchiectasis, among others.

In addition, one should always be on the lookout for influenza. Influenza is one of the top three aetiological causes of adult community-acquired pneumonia in major studies globally. In children, it is amongst the top 10. Such patient usually presents acutely with high fever (>38.5°C), cough, rhinitis, sore throat, and body aches. Influenza can become a very severe illness in a few days if it goes to the lungs and can cause multi-organ failure. An example of a chest X-ray of a 50-year-old adult with influenza pneumonia is shown in **Image 1**, depicting bilateral lung infiltrates; symptoms on presentation include fever, cough, and shortness of breath.

The other important thing about influenza is that there is a very narrow window of therapeutic opportunity as usual medications, such as the antiviral oseltamivir, are most effective only if given within 48 hours of symptom onset.

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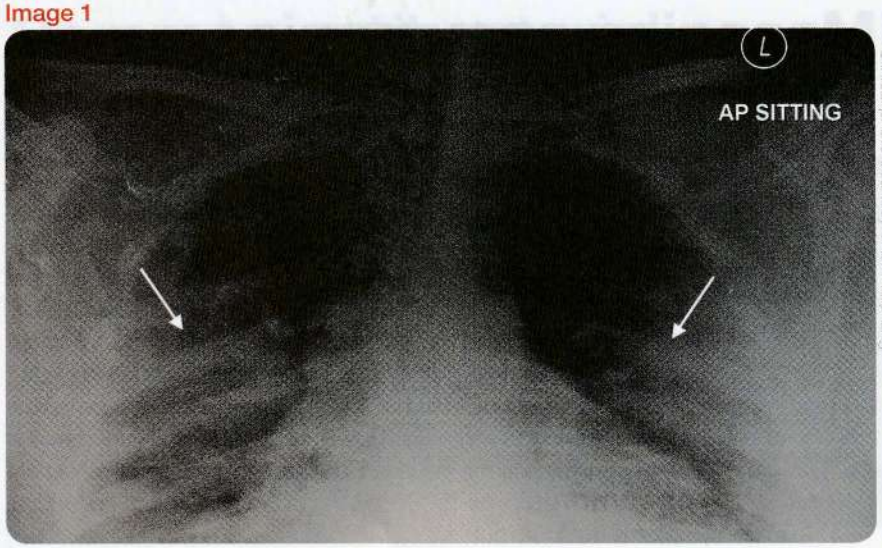
Image 1



Clinical photo courtesy of Dr Philip Eng

A chest X-ray showing bilateral lung infiltrates (white arrows) in a 50-year-old male presenting with fever, cough, and shortness of breath. PCR was positive for influenza H1N1. He subsequently developed multi-organ failure and died.

Primary care practitioners play an important role in preventing the development of influenza and pneumococcal pneumonia. Risk factors for developing such diseases are listed in **Tables 1** and **2** and vaccination should be offered to high-risk patients.

Treating pneumonia

The key aim of treatment is to achieve a good clinical outcome — prevent death or hospitalization.

Besides symptomatic treatment, the mainstay of treatment for pneumonia is antibiotics. If the patient has an influenza pneumonia, the usual treatment is to give antivirals early.

Additional points to emphasize when treating pneumonia are listed below:

- beware of using quinolones in suspected respiratory tract infections unless tuberculosis is ruled out. Quinolones can mask the symptoms and delay the diagnosis of tuberculosis;
- beware of over diagnosing mycoplasma infection. The correct method is to test for *Mycoplasma pneumoniae* IgM. There is also no need for extended use of the usual antibiotics such as tetracyclines or macrolides.

Challenges

Further to what was discussed above, the next challenge after diagnosing pneumonia in the primary care setting is to decide whether to treat or to refer to a specialist.

The first aspect to consider is the presence of risk factors such as chronic illnesses or elderly age (≥65 years). Those with severe pneumonia (eg, breathless or very sick patients), or who are very elderly, or with multiple comorbid conditions should be referred to a specialist early for further work-up or treatment. Examples of comorbidities or chronic illness requiring specialist's evaluation include stroke/neurological illness (such as Parkinson's disease), chronic severe heart disease, renal failure, cancer, HIV, asthma, and chronic obstructive pulmonary disease. Being on long-term immunosuppressive drugs such as steroids also warrants referral to a specialist.

Such patients have less immune reserve and are prone to infections caused by unusual pathogens that need to be identified concurrently during treatment.

Table 1. Risk factors for pneumococcal disease

Children at Risk for Pneumococcal Disease	Adults at Risk for Pneumococcal Disease
Children at increased risk for pneumococcal disease include those: • Younger than 2 years old • Who have certain illness (sickle cell disease, HIV infection, diabetes, immune compromising conditions, nephrotic syndrome, or chronic heart, lung, kidney, or liver disease) • With cochlear implants or cerebrospinal fluid (CSF) leaks (escape of that fluid that surrounds the brain and spinal cord)	Adults 65 years or older are at increased risk for pneumococcal disease. Some adults 19–64 years old are also at increased risk for pneumococcal disease, including those: • With chronic disease (chronic heart, liver, kidney or lung disease [including chronic obstructive lung disease, emphysema, and asthma], diabetes, or alcoholism) • With conditions that weaken the immune system (HIV/AIDS, cancer, or damaged/absent spleen) • With cochlear implants or CSF leaks • Who smoke cigarettes

Transmission
Pneumococcal bacteria spread from person-to-person by direct contact with respiratory secretions, like saliva or mucus. Many people, especially children, have the bacteria in their nose or throat at one time or another without being ill. Doctors call this "carriage" and do not know why it only rarely leads to sickness.

[https://www.cdc.gov]

Sometimes it may not be evident initially but often patients with HIV have pneumonia as the first presentation, without themselves knowing they are HIV-positive. These patients definitely need specialist care.

Referral to a specialist also applies to the following groups: patients who have not improved following initial treatment, those whose diagnosis is in doubt, those with red flag symptoms (such as hemoptysis, weight loss, prolonged symptoms), those who are in contact with others with similar symptoms, or any patient a GP feels uncomfortable treating himself.

The second aspect is to evaluate if the patient is ill. Experience counts in this aspect, but presence of tachycardia or shortness of breath are tell-tale signs to look out for. Patients who require inpatient hospitalization care also warrants care from a specialist.

In the event that a GP has initiated treatment for pneumonia as an outpatient, it is prudent to follow up on the patient until he/she has completely recovered clinically and radiographically.

Conclusion

Most patients with pneumonia can be treated quite easily with a good outcome. Family practitioners should also be on the lookout for new emerging infections presenting like pneumonia in a returning traveller. SARS in 2003 and the H1N1 influenza epidemic in 2009 are classic examples of viral illnesses causing pneumonia that can spread like wildfire in days.

Table 2. Risk factors for getting flu complications

List of health and age factors known to increase a person's risk of getting serious complications from flu:

- Asthma
- Neurologic and neurodevelopment conditions
- Blood disorders (such as sickle cell disease)
- Chronic lung disease (such as chronic obstructive pulmonary disease [COPD] and cystic fibrosis)
- Endocrine disorders (such as diabetes mellitus)
- Heart disease (such as congenital heart disease, congestive heart failure, and coronary artery disease)
- Kidney disorders
- Liver disorders
- Metabolic disorders (such as inherited metabolic disorders and mitochondrial disorders)
- People who are obese with a body mass index [BMI] of 40 or higher
- People younger than 19 years of age on long-term aspirin- or salicylate-containing medications.
- People with a weakened immune system due to disease (such as people with HIV or AIDS, or some cancers such as leukaemia) or medications (such as those receiving chemotherapy or radiation treatment for cancer, or persons with chronic conditions requiring chronic corticosteroids or other drugs that suppress the immune system)

Other people at high risk from flu:

- Adults 65 years and older
- Children younger than 2 years old[1]
- Pregnant women and women up to 2 weeks after the end of pregnancy
- People who live in nursing homes and other long-term care facilities

[1] Although all children younger than 5 years old are considered at high risk for serious flu complications, the highest risk is for those younger than 2 years old, with the highest hospitalization and death rates among infants younger than 6 months old.

[https://www.cdc.gov]

Online resources

https://www.cdc.gov/pneumonia/management-prevention-guidelines.html

https://www.idsociety.org/practice-guideline/community-acquired-pneumonia-cap/

(The last IDSA guidelines on community-acquired pneumonia was published more than 10 years ago and is due to be revised but it still remains universally authoritative and contains many useful principles in the management of community-acquired pneumonia.)