

Opinion

Community-Acquired Pneumonia in Primary Care

Introduction

Community-acquired pneumonia (CAP) is one of the commonest conditions presenting to primary care, with an estimated annual incidence in the UK of between 2 and 5 per 1000 population.¹ A practice comprising 10,000 patients could expect to see around 23 cases per year. The incidence is higher at extremes of age, especially <5 years and >60 years, and there is an association with male sex and socioeconomic deprivation. In the UK, 22-42% of adults with CAP are admitted to hospital. The reported mortality of adults with CAP managed in the community in the UK is less than 1%, compared to mortality rates of 9 to 15% in hospitalised patients.^{2,3} This opinion sheet is based on the British Thoracic Society's Guidelines on the management of Community Acquired Pneumonia and the accompanying Primary Care summary of these Guidelines.^{4,5}

Diagnosing pneumonia

A chest x-ray (CXR) is the definitive test for the diagnosis of pneumonia. However, access to chest radiography is limited in primary care, and therefore most diagnoses are based on clinical criteria. The typical clinical features of CAP - cough, fever, breathlessness, pleuritic chest pain, and lung crackles on examination, are shared by other respiratory conditions such as:

- Non-pneumonic lower respiratory tract infections (LRTI);
- Exacerbations of chronic lung disease, such as chronic obstructive pulmonary disease (COPD);
- Respiratory viral infections, such as influenza.

When confronted by a patient with symptoms of a LRTI, some helpful pointers in the clinical diagnosis of CAP include:

- Duration of symptoms of <24 hours - increases the probability of CXR-confirmed CAP.⁶
- New focal signs on chest examination - 39% of patients will have CXR-confirmed CAP.⁷
- Presence of the following features, which predict CAP with 91% sensitivity and 40% specificity (ie. few cases of CAP will be missed but there will be a tendency to over-diagnosis):⁸
 - ▶ fever >37.8°C;
 - ▶ respiratory rate >25 breaths/min;
 - ▶ sputum production throughout the day;

- ▶ myalgia and night sweats;
- ▶ absence of sore throat and rhinorrhoea.

In elderly patients, the classic symptoms and signs of CAP are less likely. Conversely, non-specific features such as confusion and an absence of fever are recognised.

In practice, CAP diagnosed clinically by GPs accounts for 5-12% of all cases of adult LRTI treated with antibiotics. Patients with non-pneumonic LRTI should be treated according to NICE Guidelines which describe 3 antibiotic strategies - no prescribing, delayed prescribing and immediate prescribing [<http://guidance.nice.org.uk/CG69>]. These Guidelines recommend that a no antibiotic or a delayed antibiotic prescribing strategy should be agreed for patients with the common cold or acute bronchitis. If a patient with acute cough is >65 years old and has ≥2 of the following criteria, or >80 years old and has ≥1 of the following criteria, then an immediate antibiotic prescribing strategy is recommended:

- hospitalisation in previous year
- type 1 or type 2 diabetes
- history of congestive heart failure,
- current use of oral glucocorticoids,

Severity assessment & when to refer to hospital

The first and single most important decision in the overall management of CAP is whether to manage the patient in the community or refer to hospital. This decision is best informed firstly by an accurate assessment of the severity of illness at presentation. The vast majority of patients with CAP have low severity disease and are managed effectively in the community by GPs. The commonest reasons for hospital referral/admission other than pneumonia severity are:

- Presence of unstable co-morbid illness (for example, decompensated heart failure);
- Social care needs (for example, living alone);
- Patient wishes.

The clinical judgement of the GP in disease severity assessment is crucial. The British Thoracic Society CAP Guidelines recommend that patients with CAP diagnosed in the community can be classified according to clinical judgement and the CRB65 score (Box 1) into 3 severity groupings based on risk of mortality. Management may be stratified according to severity (Box 2).

Box 1: CRB65 severity assessment tool.

Score one point for each feature present:

Confusion - new or worse than normal (see Box 3 for definition)

Respiratory rate ≥ 30/minute

Blood pressure, systolic < 90 mmHg or diastolic ≤ 60 mmHg

Age ≥ 65 years

Pulse oximeters are becoming increasingly available in primary care, but their precise utility in the management of CAP has still to be decided. Hypoxaemia is associated with poorer outcomes in hospitalised patients with CAP.⁹ A low oxygen saturation of <90%, especially in young patients without chronic lung disease, supports a decision to refer to hospital. However, the lack of hypoxaemia does not imply a low risk of adverse outcomes. Therefore, use of pulse oximetry should not replace clinical judgement and the CRB65 score.

GPs should administer antibiotics in the community to patients who have life-threatening pneumonia providing this action does not delay transfer to hospital. Intravenous penicillin G 1.2g or oral amoxicillin 1g are the preferred agents. Concern over the potential effect on subsequent microbiological investigations is not a reason to withhold treatment in these circumstances.

GPs should also consider administering antibiotics in the community for patients with suspected high severity CAP where there are likely to be delays of over six hours in the patient being admitted and treated in hospital. Inappropriate antibiotic use is a major concern both in community and hospital settings. Therefore, the clinical likelihood of CAP needs to be taken into account when considering antibiotic treatment at the time of hospital referral.

Management in the community

Patients with suspected CAP should be advised to rest and to drink plenty of fluids. This is also a good opportunity to reinforce smoking cessation advice. Smoking is an independent risk factor for the development of CAP and there is a dose-response relationship between number of cigarettes smoked and invasive pneumococcal disease.

Pleuritic chest pain may be a prominent symptom. It is commoner in younger

Box 2. Suggested management strategies for CRB65 thresholds.

Severity group	Suggested management
Low severity (CRB65 score 0)	Hospitalisation usually not required for clinical reasons
Moderate severity (CRB65 score 1 or 2)	Hospital referral and assessment should be considered, particularly with Score 2
High severity (CRB65 score 3 or more)	High risk of death and urgent hospital admission usually required.

Box 3. The Abbreviated Mental Test.¹⁵

(each question scores 1 mark. A score of 8 or less has been used to define mental confusion in the CRB65 severity score.)

- Age
- Date of birth
- Time (to nearest hour)
- Year
- Hospital name
- Recognition of two persons (eg. doctor, nurse)
- Recall address (eg. 42 West Street)
- Date of First World War
- Name of Monarch
- Count backwards 20 → 1

patients and is not necessarily indicative of a pulmonary embolism. Adequate analgesia is essential for symptomatic relief. Other adjunctive medications such as corticosteroids or vitamin C supplementation have not been shown to improve patient outcomes.¹⁰

Antibiotic management

An antibiotic is always indicated when a clinical diagnosis of pneumonia is made. At least 50% of CAP is caused by *Streptococcus pneumoniae*,² and more than 90% of pneumococcal isolates remain sensitive to penicillin.¹¹ Hence the recommended first line empirical antibiotic is amoxicillin 500mg TDS which should be administered as soon as possible given the association between early delivery of antibiotics and improved outcome.¹² A total antibiotic duration of 7 days is usual. Patients who have a penicillin allergy may be treated with either doxycycline 200mg loading dose followed by 100mg OD or clarithromycin 500mg BD, for 7 days. If infection with *Legionella sp.* (which can cause severe pneumonia) or *Mycoplasma pneumoniae* is suspected, clarithromycin (or erythromycin) is the treatment of choice.

Complications

Development of a parapneumonic effusion is the commonest complication of CAP (36-57% of bacterial pneumonias admitted to hospital). It may be the cause of persisting fever or delay in symptom resolution despite adequate antibiotic treatment.¹³ Alternatively, it may present as new onset pleuritic pain some days after initiation of treatment.

Other reasons for delay in clinical resolution include:

- an unrecognised immune defect, for example underlying myeloma or HIV;
- a resistant or unexpected pathogen causing pneumonia, for example *Legionella sp.* or tuberculosis;
- non-compliance with antibiotic or drug allergy;

- an alternative diagnosis to CAP, especially in the absence of CXR confirmation of the diagnosis. Occasionally, a second diagnosis is apparent, such as previously undiagnosed lung cancer.

Follow up

Patients with low severity CAP usually experience some improvement within 48 hours of appropriate treatment. A reassessment of disease severity and response to treatment at this point is therefore useful in determining further management. Referral to hospital for investigation (for example, a CXR to confirm the diagnosis of CAP or to identify complications) or for admission should be considered in patients who are failing to improve despite 48 hours of apparently appropriate antibiotics.

A follow up appointment at 6 weeks is often arranged for patients with CXR-confirmed CAP who are discharged from hospital. A repeat CXR is usually obtained at this point to confirm resolution. In these instances, radiological improvement is closely linked to resolution of symptoms.⁴ For patients treated in the community, clinical review at around six weeks would enable patients who are still symptomatic to be identified. Referral for a CXR or to a specialist may be appropriate for patients with delayed clinical resolution at this stage. The main concern is the early identification of any previously unrecognised condition, such as lung cancer, that might have predisposed to pneumonia in the first instance.

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