Conundrums in community-acquired pneumonia

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Clinically useful CAP management guidelines are still elusive

Community-acquired pneumonia (CAP) continues to generate controversy. Although CAP is common and generally mild, it can be life-threatening. For the treating clinician there are many questions. How much effort should be directed to establishing the aetiology, given that the responsible pathogen is infrequently diagnosed? Should the patient be managed in hospital or at home? Should one choose older, established antibiotics that work most of the time or broad-spectrum therapy that treats all imaginable pathogens but is probably unnecessary, has a less established safety record and is likely to contribute to increased cost of treatment and the emergence of resistance?

To help clinicians with these questions, international guidelines for managing CAP have been published.[1-5] However, their clinical usefulness in the Australian health care context is questionable, as they are not based on particularly robust evidence and there is marked disagreement between Europeans and North Americans on the correct approach. The North Americans recommend that extensive investigations should be avoided, many patients should be treated at home, and broad-spectrum antibiotics should be used.[1-3] The British and European guidelines are less focused on treating patients at home, suggest the use of cheaper, narrow-spectrum agents, and do not recommend dual therapy to treat both "typical" (eg, pneumococcus) and "atypical" (eg, *Mycoplasma*, *Chlamydophila* or *Legionella*) pathogens, except in patients with more severe illness.[4,5] In comparison, the Australian antibiotic guidelines[6] steer a middle course, suggesting the use of the Pneumonia Severity Index (PSI)[7] to guide the decision regarding the need for hospital admission but then also using the PSI as a tool to assist with empirical antibiotic selection. This latter feature is somewhat unique and is based on local (as yet, unpublished) data.

Some authors have suggested that investigations for CAP aetiology are not cost-effective.[8] However, these opinions are often based on studies in which sputum samples were of poor quality or were collected after antibiotics were commenced. In most cases, such investigations won't affect choice of therapy if the doctor treats for both "typical" and "atypical" agents. However, not performing these tests will mean missing the occasional unusual cause of CAP (such as *Staphylococcus aureus*, *Legionella*, community-acquired methicillin-resistant *S. aureus* and gram-negative organisms such as *Pseudomonas*). Furthermore, for hospitalised patients, the cost of these investigations is minimal compared with the cost of inpatient stay. Neglecting these investigations could lead to inappropriate management of patients who are initially thought to have CAP but who turn out to have an illness such as urinary sepsis or endocarditis. For patients who are sufficiently ill to require admission to hospital, we recommend that at least blood cultures and sputum Gram stain and cultures be performed.

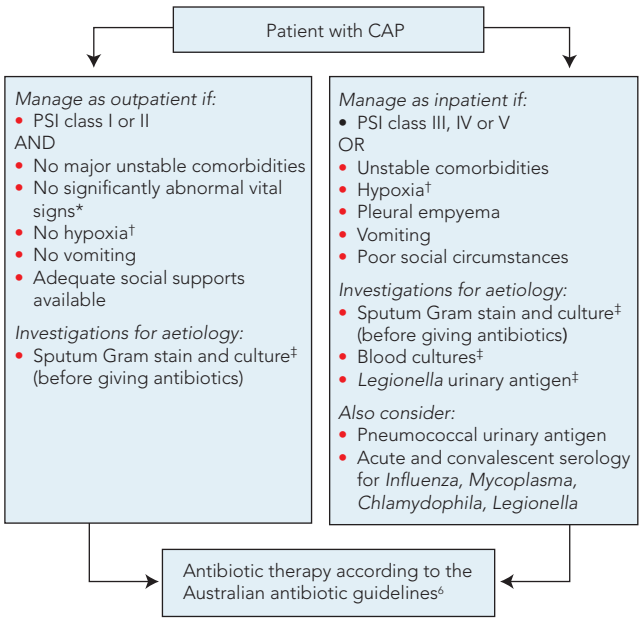
Apart from clinical acumen, what other tools can be used to assess the severity of CAP in an individual patient and hence guide the decision on site of care? The two most commonly used CAP severity scoring systems are the PSI[7] and CURB-65 (Confusion, elevated Urea, elevated Respiratory rate, low Blood pressure and age at least 65).[9] The key purpose of the PSI is to identify CAP patients who could be safely managed at home. However, it is reasonably complex, requiring input of 20 features of patient demographics, premorbid illnesses, initial vital signs and investigation results to calculate the PSI score. In addition, the PSI gives high weighting to patient age and past history but lower weighting to potentially important clinical features such as hypoxia. Thus, young, previously well patients can be classed as having mild CAP (PSI classes I–III), despite being hypoxic and having clinically severe disease. Despite these criticisms, the PSI has been validated on over 40 000 patients and appears to be accurate for predicting 30-day mortality both in the United States and Australia.[7,10] For this reason it has been recommended in the current Australian antibiotic guidelines, but its uptake by Australian doctors has been limited.[11] CURB-65 has the advantage of being simpler and more focused on the severity of the episode of CAP rather than the patient's past history. However, a disadvantage is that it appears less useful for determining who is safe to be treated at home.[12,13]

Neither the PSI nor CURB-65 appears particularly useful for predicting accurately whether an individual patient will require admission to an intensive care unit.[14] A recent Australian study suggested a modified version of CURB-65 as being more accurate for this purpose, but this is yet to be validated.[15] Given these limitations, clinicians should be mindful that features such as hypoxia, vomiting, poor social circumstances, unstable comorbid conditions and empyema often indicate the need for hospital admission regardless of the PSI or CURB-65 score.

Australian recommendations for empirical therapy are much closer to those of the UK and European guidelines than the North American guidelines, promoting the use of cheaper, narrow-spectrum agents such as penicillin and doxycycline.[6] It is notable that penicillin is not mentioned at all in the North American guidelines.[1-3] The Australian guidelines are supported by the fact that, even in an era in which penicillin resistance appears to be increasing among some *Streptococcus pneumoniae* isolates, there have been no documented failures of high-dose penicillin in treating pneumococcal pneumonia or bacteraemia. In comparison, there are documented cases of treatment failure with fluoroquinolones, and the widespread use of these agents has been clearly associated with increased levels of resistance to quinolones in *S. pneumoniae* and other previously susceptible bacteria.[16]

Given the importance of these issues, a large Australian, multi-state study of CAP is currently under way, with results to be made available in the next 12 months, to better guide clinicians. In the meantime, clinicians may find our general approach to patients with CAP useful (Box).

Approach to managing the patient with community-acquired pneumonia (CAP) confirmed by chest x-ray



PSI = Pneumonia Severity Index. * Abnormal vital signs are respiratory rate ⩾ 30 breaths/minute, heart rate ⩾ 125 beats/minute, systolic blood pressure < 90 mmHg. Young patients are less likely to be tachypnoeic. † Hypoxia is defined as partial pressure of oxygen (PaO_2) < 60 mmHg or oxygen saturation measured by pulse oximetry (SpO_2) ⩽ 90% (in patients aged ⩽ 40 years, use PaO_2 < 70 mmHg or SpO_2 ⩽ 93%). ‡ Approximate costs: sputum testing, $34; blood culture, $31; *Legionella* urinary antigen testing, $29. ◆

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