LETTERS

Severity-of-illness assessment in community-acquired pneumonia

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We believe the authors of the 2009 update of the guidelines for the management of community-acquired pneumonia[1] have confused mortality predictors with severity-of-illness scores. They state 'we have concentrated only on studies that have used mortality as the main outcome measure'. We recognise that there are difficulties in using intensive care admission as an outcome measure because of variation in admission criteria. However, 30-day survival of patients with low mortality predictor scores does not mean they were not severely ill, merely that they were treated aggressively despite their 'low risk of death'.

CURB-65 does not perform well in predicting the need for critical care compared with predicting 30-day mortality.[2 3] When judged on this outcome it does not perform as well as a modified Early Warning Score.[4] Although the authors advocate use of CURB-65 in conjunction with clinical judgement, they use as an example: 'the combination of age <50 years, absence of coexisting disease and a CRB65 or CURB65 score of 0 to identify patients with a good prognosis who *should* be suitable for home treatment' (our italics).

We would draw their attention to a hypothetical 30-year-old with legionella pneumonia whose pulse is 140, SaO_2 (arterial oxygen saturation) 90% with FiO_2 (fractional inspired oxygen) 0.8 but whose respiratory rate is only 28 and is compensating so that systolic blood pressure is 94, and is not yet confused or uraemic. This patient is clearly ill, and may meet the criteria for early goal-directed treatment but 'should' be manageable at home. Conversely, many nursing home patients are over 65, chronically confused with chronically raised urea, necessitating, according to the guidance, 'urgent hospital admission' for even the mildest chest infection.

The caveat requiring clinical judgement in addition to CURB-65 must call into question the fitness for purpose of the tool. The guidelines recognise in section 6.2 the multiplicity of physiological and social factors predictive of poor outcome; why then recommend an assessment tool which fails to include these? Most acute hospitals now use some form of Early Warning Score in accordance with National Institute for Health and Clinical Excellence (NICE) guidance on the management of the acutely ill patient, and they have been widely validated in different patient sets.[5]

We recognise the difficulties in constructing guidance to cover a wide range of presentations, but would welcome more insight into the risks of conflating mortality risk with severity of illness.

REFERENCES

1. **Lim W,** Baudouin S, George R, *et al*. British Thoracic Society guidelines for the management of community acquired pneumonia in adults: update 2009. *Thorax* 2009;**64**:iii1—iii55.
2. **Buising KL,** Thursky KA, Black JF, *et al*. Reconsidering what is meant by severe pneumonia: a prospective comparison of severity scores for community acquired pneumonia. *Thorax* 2006;**61**:419—24.
3. **Man SY,** Lee N, Ip M, *et al*. Prospective comparison of three predictive rules for assessing severity of community-acquired pneumonia in Hong Kong. *Thorax* 2007;**62**:348—53.
4. **Challen K,** Bright J, Bentley A, *et al*. Physiological-social score (PMEWS) vs. CURB-65 to triage pandemic influenza: a comparative validation study using community-acquired pneumonia as a proxy. *BMC Health Services Research* 2007;7.
5. **Gao H,** McDonnell A, Harrison DA, *et al*. Systematic review and evaluation of physiological track and trigger warning systems for identifying at-risk patients on the ward. *Intensive Care Med* 2007;**33**:667—9.

Authors' reply

We thank Challen *et al* for their interest in the guidelines and for raising an important discussion point. In describing disease severity, mortality is the main outcome measure used in the majority of studies of community acquired pneumonia (CAP). The largest evidence base therefore relates to this very specific outcome. In contrast, criteria for admission to critical care units vary across units and from country to country and, in practice, only a proportion of patients with CAP are usually considered suitable for admission.

As Challen *et al* suggest, no prognostic model is perfect. The CURB65 score is comparable to more complicated models such as the Pneumonia Severity Index that takes into account 20 different variables. Studies of the CURB65 score in patients from different cohorts and different countries indicate that the score is valid for the majority of patients with CAP, and use of the CURB65 score is included in the Infectious Diseases Society of America/American Thoracic Society CAP guidelines[1] as well as the European Respiratory Society guidelines for CAP.[2] There will always be situations that fall outside any prognostic model and examples are given in the guidelines, together with further examples offered by Challen *et al*. The example they give of an elderly patient with mental confusion and chronic renal impairment and a 'mild chest infection' allows us to emphasise again the point that we made so strongly in the guidelines—the BTS CAP guidelines are for the management of patients with pneumonia (which in the hospital setting is confirmed by a chest x-ray) and should not be applied to patients with other respiratory tract infections such as non-pneumonic lower respiratory tract infections or with a vague diagnosis of 'chest infection'.[3] If such a patient had pneumonia, existing data indicate that he/she would be at higher risk of death than an age-matched patient without the same comorbid illnesses. The appropriateness of any management decision must take into account a variety of factors. This requires sound clinical judgement by the attending physician and adequate supervision of more junior staff. Guidelines cannot cover every eventuality. In practice, prognostic models offer an objective complementary assessment of disease severity and are not recommended for exclusive use. If a prognostic model matches the clinician's assessment of disease severity, it provides for greater confidence to the decision-making process. When there is a mismatch between a prognostic model and a clinician's assessment, this should serve as a prompt for a closer evaluation of the situation which may include involvement of a second or senior opinion. The exercise of careful clinical judgement does not obviate the value of the prognostic model.

Disease severity assessment is an iterative process keeping pace with changes in a patient's condition. The guidelines uphold the use of 'track and trigger' tools such as the Early Warning Score (EWS) for the monitoring of patients' progress in the hospital setting (section 7.3 of the guidelines, Monitoring in hospital). This is consistent with the fact that the main validation of EWS is in regard to changing situations after hospital admission rather than as a single 'snapshot' at presentation for which disease-specific tools such as the CURB65 score have been shown to be better than generic tools such as the standardised EWS.[4] Generic track and trigger tools are therefore seen as complementary to disease-specific prognostic models.

Indications for transfer to critical care are given in section 7.4 of the guidelines. These are not proscriptive but reflect general principles. Clinical judgement, preferably by a senior clinician, remains paramount.

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REFERENCES

1. **Mandell LA,** Wunderink RG, Anzueto A, *et al*. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis* 2007;**44**(Suppl 2):S27–72.
2. **Woodhead M,** Blasi F, Ewig S, *et al*. European Respiratory Society/European Society of Clinical Microbiology and Infectious Diseases guidelines for the management of adult lower respiratory tract infections [erratum appears in *Eur Respir J* 2006;**27**:439]. *Eur Respir J* 2005;**26**:1138–80.
3. **Lim WS,** Baudouin SV, George RC, *et al*. Pneumonia Guidelines Committee of the BTS Standards of Care Committee. BTS guidelines for the management of community acquired pneumonia in adults: update 2009. *Thorax* 2009;**64**(Suppl 3):iii1–55.
4. **Barlow GD,** Nathwani D, Davey PG. The CURB65 pneumonia severity score outperforms generic sepsis and early warning scores in predicting mortality in community-acquired pneumonia. *Thorax* 2007;**62**:253–9.

Is investigation of patients with haemoptysis and normal chest radiograph justified?

We read with interest the article by Thirumaran *et al*.[1] They described their experience of 270 consecutive patients referred with haemoptysis and a normal chest radiograph. In their study they found the incidence of respiratory malignancy within this group was 9.6% (26 individuals) and of these 22 were primary lung malignancies. This is slightly higher than the 3–6% incidence previously reported in the literature.[2–4]

We have delivered a nurse-led clinic for patients referred via the 2 week wait system with haemoptysis and a normal, or non-localising, chest x-ray. Patients were stratified into high risk or low risk groups according to age and smoking history. An algorithm was then devised to guide further investigation (available as figure 1 online).

A total of 348 patients were seen in this clinic (215 male, 133 female) between 2003 and 2008. Leicester has a large ethnic minority population and 41 (11.8%) of the 348 patients were of South Asian origin.

Thirty-four patients referred, on detailed history taking, did not have haemoptysis at all. The presenting problems reported by these patients included bleeding gums, ill-fitting dentures and epistaxis.

The investigation modality of choice was CT scanning of the thorax and upper abdomen. A total of 163 patients were referred for CT scan at their initial consultation with the nurse. Fibreoptic bronchoscopy (FOB) was only utilised to confirm tissue diagnosis in patients diagnosed with a thoracic malignancy.

Twenty-three patients (6.6%) were diagnosed with a lung malignancy in our clinic.

The other common diagnostic causes of haemoptysis are shown in table 1.

Median age was 69 years (range 54–80).

In the 23 patients with lung cancer, only 6 (1.7%) had a chest x-ray that was reported as entirely normal. Seventeen patients had chest x-rays that were either not entirely normal or had not been screened appropriately prior to admission to the clinic. Reasons for this included not having a chest x-ray prior to clinic, and the chest x-ray performed in clinic was then found to be abnormal. Review in clinic of all reported normal chest x-rays also identified abnormalities in several patients. One patient had been CT scanned prior to his appointment in the haemoptysis clinic. Variables within the non-localising x-rays included increased cardiothoracic ratio, bullae and hyperinflated lung fields. One chest x-ray report suggested that the 'bulky' mediastinal appearance was likely to be due to rotation.

Persistent haemoptysis (duration of >1 week) was seen in 15 of the 23 lung cancer patients but was also seen in 145 of the 325 patients with a benign diagnosis. Duration of haemoptysis is therefore not a good predictive factor of risk for malignancy and this further supports the work of the previous authors.

Haemoptysis is a fairly common, usually self-limiting symptom which is accounted for mostly by infection or an idiopathic cause. Approximately 10% of people referred with this symptom will not actually have haemoptysis.

We reviewed our lung cancer patients retrospectively, and found that a previous history of any malignancy was important and should be added to the risk stratification algorithm.

The clinic ceased to run in January 2009 and, to date, no patients have been re-referred or appeared on the cancer database. This would also suggest that our model is a safe, efficient method of screening patients with a possible thoracic malignancy and freeing up resources in the urgent 2 week wait clinic.

Table 1 common diagnostic causes of haemoptysis

Diagnosis	Number of patients
Cancer	23
Bronchiectasis	52
Infection	107
Idiopathic	70
ENT	24
Cardiac	6
Pulmonary embolism	5
Not haemoptysis	34
Anticoagulation therapy	8
Vasculitis	4
DNA follow-up	13
Died	2

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REFERENCES

1. **Thirumaran M,** Sundar R, Sutcliffe IM, *et al*. Is investigation of patients with haemoptysis and normal chest radiograph justified? *Thorax* 2009;**64**:854–6.
2. **Poe RH,** Israel RH, Marin MG, *et al*. Utility of fiberoptic bronchoscopy in patients with hemoptysis and nonlocalizing chest roentgenogram. *Chest* 1985;**93**:70–5.
3. **Jackson CV,** Savage PJ, Quinn DL. Role of the fiberoptic bronchoscopy in patients with hemoptysis and a normal chest roentgenogram. *Chest* 1985;**87**:142–3.
4. **Santiago SM,** Lehrman S, Willams AJ. Bronchoscopy in patients with haemoptysis and normal chest roentgenograms. *Br J Dis Chest* 1987;**81**:186–88.

The learning curve for EBUS-TBNA

We read with interest the paper by Kemp and colleagues[1] which utilises cumulative sum (CUSUM) to analyse the learning curves associated with endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). The retrospective study from five centres demonstrated that variable learning periods are required to attain proficiency in the procedure, and a pooled sensitivity of 67.4% was observed.

The authors are to be commended on using CUSUM to calculate the learning curves for EBUS-TBNA; however, several points deserve comment. First the study only includes patients undergoing EBUS-TBNA for the diagnosis or staging of lung cancer. In clinical practice, the procedure is also commonly employed for the diagnosis of isolated mediastinal lymphadenopathy, and these procedures should be incorporated in the learning process. Secondly, the authors included non-malignant nodes in the CUSUM analysis. Therefore, it may be possible to inadequately sample a benign node and for the result to be assigned as a true negative. This highlights the importance of reporting the disease prevalence for each cohort. Thirdly, utilising the criteria employed in this paper, there is potential to