propionate and salmeterol in general practice. *Eur Respir J* 2002;**20**:819–25.
15 **Sin DD**, Man SFP. Inhaled corticosteroids and survival in chronic obstructive pulmonary disease: dose the dose matter? *Eur Respir J* 2003;**21**:260–6.
16 **Goldstein H**. *Multilevel statistical models*, 2nd ed. London: Edward Arnold, 1995.
17 **Sherrill DL**, Viegi G. On modeling longitudinal pulmonary function data. *Am J Respir Crit Care Med* 1996;**154**:S217–22.
18 **Calverley PMA**, Spencer S, Burge PS, *et al*, on behalf of the Isolde study group. Withdrawing from treatment as an outcome in chronic obstructive pulmonary disease. *Chest* (in press).
19 **Weir DC**, Weiland GA, Burge PS. Decline in FEV_1 in patients with chronic airflow obstruction. Relation to acute steroid response and treatment with inhaled corticosteroids. In: Postma DS, Gerritsen J, eds. *Bronchitis V*. Essen: Van Gorcum, 1994:280–6.
20 **Calverley PMA**, Burge PS, Spencer S, *et al*, on behalf of the Isolde study group. Bronchodilator reversibility testing in chronic obstructive pulmonary disease. *Thorax* 2003;**58**:659–64.
21 **Burge PS**, Calverley PMA, Jones PW, *et al*, on behalf of the Isolde study group. Prednisolone response in patients with chronic obstructive pulmonary disease; results from the Isolde study. *Thorax* 2003;**58**:654–8.
22 **Weir DC**, Gove RI, Robertson AS, *et al*. Response to corticosteroids in chronic airflow obstruction: relationship to emphysema and airways collapse. *Eur Respir J* 1991;**4**:1185–90.
23 **Jarad NA**, Wedzicha JA, Burge PS, *et al*. An observational study of inhaled corticosteroid withdrawal in stable chronic obstructive pulmonary disease. Isolde study group. *Respir Med* 1999;**93**:161–6.
24 **van der Valk P**, Monninkhof E, van der Palen J, *et al*. Effect of discontinuation of inhaled corticosteroids in patients with chronic obstructive pulmonary disease. The COPE study. *Am J Respir Crit Care Med* 2002;**166**:1358–63.

Lung biopsy

Lung biopsy guidelines—for the obedience of fools and guidance of wise men

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Lung biopsy is not without morbidity and occasionally mortality

Percutaneous transthoracic lung biopsy is thought to have been developed by Leyden in 1883 in order to diagnose pneumonia. The technique was extended to the diagnosis of cancer from the 1930s onwards, but at that time there was a significant complication rate, primarily associated with the use of large bore needles. The more widespread use of the technique in the 1960s and 1970s was heralded by the development of high resolution image intensification and improved cytological techniques, which permitted the use of smaller needles and reduced complications. One hundred and twenty years after its inception, percutaneous lung biopsy is now a generally accepted and widely used method of establishing the aetiology of lung masses.

Despite its usefulness, the procedure is not without its morbidity and rarely mortality. It was one of these rare deaths that prompted a search for current standards of good practice. A survey published in 2002 by Richardson *et al*,[1] in which all known centres performing lung biopsy in the United Kingdom were invited to participate, showed that practice varied greatly across the country. Some centres reported undertaking as few as three biopsies a year and others over 200. There appeared to be a general lack of consensus about most aspects of the procedure, and this was reflected in confusion over whether patients needed to be admitted overnight, the range of prebiopsy tests required, and the timing of follow up chest radiographs. This was the first national study of percutaneous lung biopsy in the United Kingdom and it concluded that national guidelines were needed to ensure consistency of standards. The guidelines published in *Thorax* this month have been with this aim.

Any guidelines will generate objections to at least some of their recommendations and for that reason the current paper has been reviewed by various groups and societies who can be regarded has having an interest in the topic. As the title of the article suggests, they are intended to offer guidance based on evidence to those with experience and to help those who have a more limited practice.

One of the main developments in the management of lung cancer has been the formalisation of the multidisciplinary team, which is now the cornerstone of clinical practice in this disease. These guidelines encourage the use of the same concept in the process of deciding in whom and how to biopsy lung lesions. The term ''multidisciplinary meeting'' (MDM) has been used partly to avoid confusion with the cancer group, but also to make clear that the decision making group is not as large and is less rigid in its structure. Despite this the MDM, consisting of at least a radiologist and a respiratory physician, or a clinician with an interest in respiratory medicine, is recommended as the way in which decisions about whether to undertake a lung biopsy should be organised. This practice should ensure a proper preprocedure assessment, both of the need for biopsy and of patient suitability.

There is controversy over the role of percutaneous biopsy in the diagnosis of potentially resectable lung masses in patients considered operable. Some units prefer to proceed straight to surgery in this situation, arguing that a percutaneous biopsy rarely changes the need for surgery in these patients. Others feel that patients should have a histologically confirmed malignancy before proceeding to surgery, to avoid doing unnecessary operations in those who have benign disease. This difficult issue has not been addressed in these guidelines, but it serves to emphasise the importance of multidisciplinary decision making before biopsy.

These guidelines do not seek to be prescriptive. Some operators may have a preference for a particular type of needle or means of imaging. This often depends on the local circumstances or external factors. Where evidence is available, the most appropriate method has been advised. For instance, if a lesion is suspected to be benign the yield in these circumstances is favoured by the use of a cutting needle. However, in certain centres where there is a confident cytopathologist, fine needle aspiration may achieve similar accuracy of sampling for benign lesions. Similarly, having a cytologist present at the time of biopsy to review the sample reduces morbidity and increases yield but has significant resource implications.

Recently there has been a move to do lung biopsies as day case procedures, and this practice has been implemented successfully in many centres. Published reports indicate that this can lead to better use of hospital beds without an increase in the risk to the patients if they are selected appropriately. It does, however, depend on instructing the patient carefully and giving written and verbal instructions should their condition deteriorate on leaving hospital.

It is worth remembering that guidelines are only as good as the evidence they are based upon. One of the main problems in establishing procedural guidelines is the lack of grade A, or even grade B, evidence to support particular practices. The published morbidity and the mortality rates associated with percutaneous lung biopsy vary widely. The quoted pneumothorax rate post-biopsy ranges from 0% to 61%, although in the UK survey[1] the range was between 14% and 20%. Clearly practitioners should aspire to the lowest figure, but centres should audit their own practice in order to inform patients of local complication rates.

Furthermore, to ensure that normal clotting studies are available before a biopsy would seem prudent, but no randomised controlled trials have ever been done to assess this. Similarly the safe cut off values for FEV_1 are difficult to establish but for obvious ethical reasons no grade A evidence exists. In cases where the evidence base is weak, common sense and consensus have been used. Additionally good practice has been derived in some areas by looking at the advice given by other groups such as the BTS guidelines on diagnostic flexible bronchoscopy.[2]

In conclusion, although a few of the recommendations may go against some practitioners' cherished practices, they are intended to offer food for thought for the experienced and guidance for the less experienced—*they are for the obedience of fools and the guidance of wise men*.

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REFERENCES

1 **Richardson CM**, Pointon KS, Manhire AR, *et al*. Percutaneous lung biopsies: a survey of UK practice based on 5444 biopsies. *Br J Radiol* 2002;**75**:731–5.
2 **British Thoracic Society Guidelines Committee**. British Thoracic Society guidelines on diagnostic flexible bronchoscopy. *Thorax* 2001;**56**(suppl I):i7.

Inpatient management of acute COPD

Inpatient management of acute COPD: a cause for concern?

M Rudolf

Inpatient mortality rates for patients with COPD vary with the type of hospital

British guidelines for the management of chronic obstructive pulmonary disease (COPD) were first published in 1997.[1] Over the subsequent 6 years there has been an enormous increase in our understanding of the underlying causes and mechanisms of acute exacerbations of COPD,[2–4] as well as the realisation that, in addition to being a major cause of morbidity and mortality, acute exacerbations place an enormous burden on healthcare resources.

COPD is the third largest cause of respiratory death in the UK after pneumonia and cancer, causing over 30 000 deaths per year. Age adjusted emergency admission rates for COPD in the UK rose by more than 50% between 1991 and 2000, and about one quarter of all hospital inpatient bed days used for treating acute respiratory disease are for COPD,[5] amounting to nearly one million hospital bed days per year.[6]

With such a significant proportion of inpatient resources being consumed by acute exacerbations of COPD, understanding how well and effectively they are managed in hospital becomes a matter of much more than academic interest. In order to obtain information on this, the British Thoracic Society (BTS) and the Clinical Effectiveness and Evaluation Unit (CEEU) of the Royal College of Physicians undertook a national audit in 1997.[7 8]

Data were collected from 38 acute hospitals across the UK on the management of 1400 acute admissions with COPD. The main findings were that 14% of cases died within 3 months of admission, the median length of stay was 8 days, and 34% of the patients were readmitted within 3 months of the initial inpatient episode. There were, not surprisingly, large variations between hospitals for many of the outcome measures studied and, disappointingly, the median standards of care observed in routine clinical practice fell below those recommended by the BTS guidelines.[7 8]

An important conclusion from this audit was that the wide variations observed in both process of care and in outcomes could not be accounted for by case mix alone, and that resource and organisational factors might be relevant. In this issue of *Thorax* Roberts *et al*[9] report the results of a further audit designed to test the hypothesis that death from acute COPD might be related to the size and type of hospital to which patients are admitted—for example, teaching hospital or large or small district general hospital (DGH)—and to factors such as medical staffing ratios and the availability of non-invasive ventilation (NIV).

The authors obtained information from 30 units in England and Wales using prospective case ascertainment with retrospective case note audit of consecutive cases admitted over an 8 week period for each hospital. Despite the limitations of the study which the authors freely acknowledge (it was only a pilot study, small number of hospitals, some data collection may have been incomplete and/or inaccurate), the results are of extreme importance. Mortality was highest in the small DGHs and lowest in the teaching hospitals. Although the performance status of patients being admitted to small DGHs was worse, this did not account for the higher mortality observed. Small DGHs also had the lowest medical staffing ratios and were less likely to offer an NIV service.

It is imperative that these findings are verified in a much larger national audit which is currently being conducted by the BTS and CEEU. This should allow for a far more detailed analysis and, in addition to accurate data collection on individual patients, participating hospitals must provide comprehensive information on their local resources for the management of acute COPD, including