COPD exacerbations

We read with interest the paper by Cotton and associates on early discharge for patients with exacerbations of chronic obstructive pulmonary disease and the accompanying editorial by Killen and Ellis. In both publications the 1991 study of our RespiCare home care programme was referenced, and both asserted that our programme was not cost effective. In fact, our study reached the opposite conclusion—namely, that the RespiCare programme was shown to be cost effective.

Actual direct care charges in US dollars were used in our calculations of both pre-programme and on-programme costs. Additionally, administrative costs of operating RespiCare were added into the on-programme costs. Our findings showed that, while hospitalisation costs substantially decreased during the programme, home care costs increased. However, the decrease in hospital costs more than offset the subsequent increase in home care costs, with a total cost savings of $328 US dollars per patient per month or $3956 per year being realised for those on the RespiCare programme.

Although the emphasis of the work was on improvements in clinical outcome, the cost savings were a significant and important aspect of our study.

I hope this clarifies any misunderstanding created by the recent articles.

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CFC transition

The editorial by Mark Everard reveals an interesting viewpoint about inhaler therapy and delivery systems. However, the selective quotation of published trial evidence introduces the potential for bias in his conclusions. This is particularly apparent in the discussion on the ability of patients to use pressurised metered dose inhalers (pMDI) correctly. Like many other reviews in this field, selective citation of published papers leads to conclusions that inhaler devices are used more effectively than pMDIs.

We have recently completed an NHS sponsored systematic review of the published literature on the clinical and cost effectiveness of inhaler devices. One aspect, a systematic review of the clinical efficacy of pMDIs versus dry powder inhalers (DPIs), found that eight of the 14 clinical studies included in the review cited papers showing poor pMDI technique, including two citing the same paper as Everard by Crompton. The British Thoracic Society asthma guidelines also stress such problems: “Many patients are unable to use MDIs correctly...addition of a spacer device will reduce coordination problems.” An additional aspect of the review was inhaled technique. Analysis of studies in which more than one type of inhaler device was assessed (six studies) showed that the “ideal” inhaler technique was found in 59% (95% CI 51 to 67) for DPI, in 43% (95% CI 36 to 50) for pMDI alone, and in 55% (95% CI 49 to 61) for pMDI dose with spacer. If the same outcome is considered after a period of inhaler technique teaching (20 studies), then the results are 65% (95% CI 59 to 71) for DPI, 63% (95% CI 60 to 67) for pMDI alone, and 74% (95% CI 53 to 88) for pMDI dose with spacer. There is marked heterogeneity within these studies and thus selective citation could show any one to be better than another.

We agree that clinical testing of all inhaler devices is critical in informed decision making, but the editorial by Everard may imply that pMDIs are worse than other devices thus encouraging the use of perhaps even less well evaluated devices and at a greater financial cost—an outcome we are greater financial cost—an outcome we are not striving for. We would suggest that there is an explanation for these unusual findings.

Firstly, mild, moderate and severe obesity are all associated with an incremental reduction both of the forced expiratory volume in 1 second (FEV1) and the forced vital capacity (FVC). Secondly, in normal subjects and in those who have pure restrictive impairment, the FVC and FEV1 are within 2–3% of each other when expressed as a percentage of predicted. The FVC cannot be significantly smaller than the FEV1, when expressed as a percentage of predicted except in certain neurological diseases. It is noted that the criterion for acceptance of the spirometric volumes was “two measurements of the FEV1 within 100 ml of each other”, suggesting the FVC was ignored. Table 3 in the paper by Schachter et al shows that, when expressed as a percentage of predicted, the FVC in every instance is less than the FEV1. In most groups there is a relatively small difference except for those who are moderately or severely obese.

The reason for the disparity in the FEV1 and the FVC is that the FVC manoeuvre is likely to be incomplete, especially in those who are overweight. Some normal large men over 74 inches in height take 12–16 seconds to complete their FVC manoeuvre. Unfortunately, these days few physicians spend any time doing routine spirometric testing themselves as they rely on their technicians. Shoe leather epidemiologists such as Archie Cochrane and Ian Higgins have been replaced by computer addicted statisticians who are thrown into ecstasy by what they can do with a computer, but who fail to realise that their original data may be flawed. We are not saying that the Dr Schachter and her colleagues to review their findings, we suspect that they would find that at least some of the FVC manoeuvres had been aborted prematurely. If only flow-volume loops are relied upon this needs to be borne in mind that it is difficult—and, indeed, usually impossible—to know whether the FVC manoeuvre has been completed.

The other surprise in the study is that the smaller the FVC when expressed as a per


Obesity and lung function

The paper by Schachter et al in the January 2001 issue of Thorax is interesting in that it has a number of unusual and, it is suggested, inexplicable findings that appertain to various indices of ventilatory capacity. With all due deference, we would suggest that there is an explanation for these unusual findings.

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The other surprise in the study is that the smaller the FVC when expressed as a per

percentage of predicted, the higher the FVC. What is abundantly clear, however, is that, when the FVC manoeuvre is incomplete, then the FEF_{25-75} is “pushed” further up the steeper portion of the FVC curve so that the FEF_{25-75} is artefactually increased—that is, the more premature the termination of the FVC, the higher the FEF_{25-75}.

The findings of wheeze in those who are obese is not surprising, especially in cigarette smokers. When a markedly obese subject exercises on the treadmill wheezes are frequently heard, providing he can continue, exercise-induced asthma. This may explain the much more frequent medication usage.

We suggest the disparate reduction in the FVC and FEV₁, seen in obese subjects has little to do with asthma, but is a direct effect of their obesity and the fact that some of the FVC measurements have been significantly underestimated.

Authors' Reply

I am pleased to note that Drs Ahmad and Morgan were able to pick up on one of the main points of our paper—that reduced lung function and respiratory symptoms in obese people may well be an effect of their obesity and not necessarily an indication of asthma. However, they imply that the differences in spirometric function that we observed were due to technical error rather than to an effect of obesity. As a physician who has spent a substantial amount of time measuring routine spirometric parameters on over 300 severely obese patients, I disagree with their suggestion.

As with a number of previous studies, we found that moderate and severe obesity were associated with an incremental reduction in both FEV₁ and FVC. In our normal subjects the FEV₁ and FVC, expressed as percentage predicted, were within 2.6% of each other. The mean absolute values for FEV₁ and FVC in this group were 3.5 l and 4.0 l, respectively. The mean FEV₁/FVC% in all groups was 85.8–87.6%, which is well within the normal range for this age group.

Our results show that most patients with severe obesity have FVC within the normal range, although it is reduced when compared with patients with normal body mass index. We do not have other measurements of lung volumes to confirm further the presence of restriction, but these findings are consistent with those of other studies.

It is unlikely that our results are due to a systematic underestimation of FVC in the obese groups. In my experience, obese patients who are otherwise healthy do not usually have lung obstruction or a need for prolonged expiration times to complete their FVC manoeuvres. Their spirometric tracings show that the expiration reaches a clear plateau within 2–3 seconds in the same way as is seen in non-obese subjects.

The technical staff involved in the collection of the data are extremely well trained and the measurement methods are well standardised. The same two senior researchers were present at all studies and trained and supervised all other staff involved. Our senior researchers and technicians are very experienced, having performed many large epidemiology studies involving thousands of subjects. The FVC manoeuvre was performed to a minimum of 3 seconds. The criterion for acceptance of the spirometric volumes included both FEV₁ and FVC and required both parameters to be repeatable to within 100 ml. These procedures are stricter than the ATS guidelines which allow for 5% variability between blows. If it appeared that the patient was obstructed, then FVC was performed until expiration was complete.

In reporting our results we did not attempt to draw any conclusions from the very small differences between the percentage predicted FEV₁ and FVC values. Instead, we limited our discussion to the more substantial differences between groups based on body mass index—the hypothesis that we set out to test.

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Lung cancer survival

We read with great interest the article by Gregor and colleagues on the management and survival of patients with lung cancer in Scotland diagnosed in 1995.1 The results were disappointing, but we congratulate them for their recognition of present conditions and for reporting the scientific analysis. In the 1990s several new chemotherapeutic drugs for lung cancer emerged, although the results of the large phase III studies were disappointing.1,2 It is fair to say that standard treatment for advanced lung cancer, especially for non-small cell lung cancer, is not yet established. Several well designed clinical trials have been reported in first class medical journals, but the prognosis of lung cancer is still poor. Published regimens for selected patients to define new study protocols may be inappropriate for use in clinical practice. Many of our patients are ordinary people who have several underlying illnesses and may be too sick to be enrolled into clinical trials, and it is they who need treatment which can be applied in common practice. There is no disagreement on the point that the level of evidence obtained from the retrospective study of heterogeneous patients is low; however, we believe that a study with well analysed data of patients who are otherwise not eligible for randomised control trials also has clinical significance and would benefit such patients. We hope that the first class medical journals such as Thorax continue to encourage, not only randomised control trials, but also reporting of retrospective studies to complement the area where strong evidence is unobtainable.

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NOTICES

Respiratory Medicine

A conference on the “Pharmacology of Asthma” organised by Professor Peter Barnes will be held at the Imperial College School of Medicine at the National Heart & Lung Institute in collaboration with the Royal Brompton Hospital, Dovehouse Street, London SW3 6LY, UK on 26–29 November 2001. The course is suitable for physicians or scientists with an interest in the pharmacology and therapeutics of asthma. For further information please contact the Postgraduate Education Centre, Imperial College School of Medicine at the National Heart & Lung Institute, Dovehouse Street, London SW3 6LY. Telephone: 020 7351 8712. Fax: 020 7351 8246. Email: shortcourses.nhl@ic.ac.uk
Obesity and lung function

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