

# An audit of inhaler technique among asthma patients of 34 general practitioners

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**SUMMARY.** Doctors from 34 practices participated in an audit study which examined inhaler technique in up to 20 of their patients. A new scoring system, applicable to all forms of device, was used. Although the majority of the 422 patients (63%) was using metered dose inhalers, a broad range of other devices was included; most frequently Rotahalers (15%) and spacer devices (9%). For analysis, technique scores were rated as 'good' (score 4 out of 4), 'adequate' (score 3 or 4) and 'inadequate' (score 2 or less). Overall, 25% of patients had inadequate technique. Of all devices, the Turbohaler had the highest proportion of patients with good technique (78%), and metered dose inhalers the lowest (45%).

This audit confirms that technique is unsatisfactory for a significant proportion of patients, regardless of the device used. A simple scoring system promotes consistent testing of technique within a practice.

## Introduction

ONE of the biggest changes in asthma management in recent times has been the transition from oral to inhaled therapies as the preferred route of administration.

In an early published report Paterson and Crompton showed that 14% of their sample using metered dose inhalers had poor inhaler technique despite repeated instruction in correct usage.<sup>1</sup> In recent years other surveys have consistently shown that large numbers of patients are unable to use metered dose inhalers satisfactorily.<sup>2-4</sup> In some cases, but not all, this deficiency in technique can be attributed solely to lack of instruction.<sup>5</sup>

Most reports on inhaler technique relate to metered dose inhalers but a wide range of alternative devices has now been produced: dry powder devices are used extensively; and 'spacer' devices have enabled young children and severely affected patients to benefit from inhaled therapy. This paper reports an audit of inhaler technique in several types of inhaler by asthma patients attending general practitioners with a professed interest in asthma. The aims of the study were to assess levels of competence in inhaler users and to assess the usefulness of a standardized scoring system applicable to all forms of device.

## Method

The General Practitioners in Asthma group has more than 200 members nationally. Thirty four members from 34 practices agreed to recruit up to 20 patients for the study, over a three week period during July 1989. All patients were surgery attenders who were taking inhaled treatments for asthma, but not necessarily consulting for it. For each patient treatment details and a score for inhaler technique using their own device were recorded on a standard form. The score was based on four steps, applicable to any inhaler device: (a) adequate preparation; includes having serviceable device, shaking canister (for metered

dose inhaler), or loading correctly (for other devices); (b) adequate expiration, correct head position; (c) adequate inspiratory technique; (d) holding breath afterwards. Each step scored one point, giving a score in the range 0-4.

The completed forms were returned to the author. Data were analysed using the SPSS-PC package. An inhaler score of 2 or less was judged as 'inadequate', 3 or 4 as 'adequate' and 4 as 'good'. Variables were cross tabulated, and the chi squared test applied.

## Results

The 34 participants collected data on 422 patients (51% male). All age groups were represented: 25 (6%) were aged five years or under; 92 (22%) were aged six to 15 years; 91 (22%) were 16-35 years; 138 (33%) were 36-65 years; and 76 (18%) were aged 65 years or over. Inhaled treatments taken by the patients were: salbutamol 74%; beclomethasone 40%; other bronchodilators 14%; budesonide 6%; cromoglycate 4%; others (including ipatropium bromide and nedocromil) 3%. A single inhaled drug was being taken by 55% of patients and only 4% ( $n=18$ ) were taking more than two inhaled drugs. Thus 52% of patients were using inhaled preventive treatment, predominantly beclomethasone.

Data were available on inhaler devices used by 419 patients: 262 (63%) were using metered dose inhalers; 62 (15%) were using Rotahalers (Allen and Hanburys); 36 (9%) spacer devices; 23 (5%) Turbohalers (Astra); 26 (6%) Diskhalers (Allen and Hanburys). Only 12 patients were using other devices (the Spinhaler (Fisons) and the Autohaler (Riker)) and in view of this they were excluded from further analysis.

Overall, for all types of inhaler 25% of patients had inadequate technique (score of 2 or less). Table 1 shows that a higher proportion of Turbohaler users achieved an adequate or good score compared with metered dose inhaler users ( $\chi^2=9.7$ ,  $df=4$ ,  $P<0.05$  for adequate technique;  $\chi^2=11.4$ ,  $df=4$ ,  $P<0.05$  for good technique).

When users of metered dose inhalers were compared with users of all other devices a significantly lower proportion had adequate or good technique: 70% versus 82% for adequate technique ( $\chi^2=6.2$  with Yates' correction,  $df=1$ ,  $P<0.05$ ); 45% versus 57% for good technique ( $\chi^2=5.4$ ,  $df=1$ ,  $P<0.05$ ). For the Turbohaler, a significantly greater proportion of users had adequate or good technique compared with users of other methods: 96% versus 73% for adequate technique ( $\chi^2=4.8$  with Yates' correction,  $df=1$ ,  $P<0.05$ ); 78% versus 47% for good technique ( $\chi^2=7.1$  with Yates' correction,  $df=1$ ,  $P<0.01$ ).

For steps a-c in technique (adequate preparation, adequate expiration and adequate inspiratory technique), more users of the Turbohaler scored positively compared with users of metered dose inhalers (step a:  $\chi^2=10.8$ ,  $df=4$ ,  $P<0.05$ ; step b:  $\chi^2=14.4$ ,  $df=4$ ,  $P<0.01$ ; step c:  $\chi^2=20.3$ ,  $df=4$ ,  $P<0.001$ ). For step d (holding breath afterwards) significantly more of the Turbohaler users scored positively than the users of the Diskhaler and spacer devices ( $\chi^2=11.0$ ,  $df=4$ ,  $P<0.05$ ).

In the five years and under age group ( $n=25$ ) 64% were using spacer devices. In the six to 15 years age group ( $n=92$ ), only 10% were using spacer devices, with 44% using metered dose inhalers, 23% the Rotahaler, and 13% the Turbohaler. In adults ( $n=305$ ), metered dose inhalers were the most common type

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Submitted: 2 April 1990; accepted: 9 July 1990.

© British Journal of General Practice, 1990, 40, 505-506.

**Table 1.** Inhaler technique scores for the different types of inhaler.

Inhaler technique scores	Percentage of patients					
	Total (n = 419)	Metered dose inhaler (n = 262)	Rotahaler (n = 62)	Spacer device (n = 36)	Turbohaler (n = 23)	Diskhaler (n = 26)
0-2	25	30	21	22	4	19
3	25	25	29	20	18	27
4	50	45	50	58	78	54
Total adequate (score 3 or over)	75	70	79	78	96	81

n = number of patients.

(72%). The proportion of adults using other devices rose slightly with age, most noticeably for spacer devices.

For the six to 15 years age group, more Turbohaler users had good technique compared with metered dose inhaler or Diskhaler users: 92% versus 42% and 25% respectively ( $\chi^2=13.8$ ,  $df=4$ ,  $P<0.01$ ). Within other age groups there were no such differences.

### Discussion

This audit of general practice patients shows a higher proportion of asthmatics taking preventive inhaled therapy (>50%) than the third national morbidity survey (20%).<sup>6</sup> This probably reflects a greater interest in asthma among the doctors in the General Practitioners in Asthma Group, rather than a greater severity of their patients' asthma. Despite this interest of the doctors, a quarter of the patients had inadequate inhaler technique. More of the patients with inadequate technique were users of metered dose inhalers; however, it is interesting that approximately one in five users of all other devices except the Turbohaler had deficient technique.

The initial impression from this study — that the Turbohaler is easier to use correctly than the other devices — is questionable. The disparity in numbers between the metered dose inhaler group and the others, and the unequal distribution of age groups mean that such a conclusion would be premature. The universal scoring system is convenient and pragmatic, but may be advantageous to the Turbohaler, since preparation, which forms one quarter of the total score, is so easy,<sup>7</sup> and it has been shown that inspiratory effort is not critical for good effect.<sup>8</sup> Arguably, this need not detract from the apparent benefits of the Turbohaler, since an easily used device clearly is more likely to be used adequately.

Perhaps more importantly, we gathered no information on the previous inhaler usage of patients — either duration of use of current device; or experience with other devices. Metered dose inhalers still tend to be used as first choice by most general practitioners. If patients are found incapable of using them, they will receive more attention when starting alternative devices.

Perhaps adequacy of inhaler technique related to duration of device usage. Those patients using the Turbohaler cannot have had them for more than two years, whereas the Rotahaler has been available for seven to eight years, and metered dose inhalers for much longer. General practitioners may be less likely to review inhaler technique when the device has been prescribed over a longer period.

This study highlights the limitations of a single audit. Nevertheless, two important inferences can be drawn from the results: first, inhaler technique is inadequate for a substantial minority of patients whatever device is used; secondly, devices prescribed over long periods could be given greater priority than those recently prescribed when checking technique. A repeat audit by these practitioners could test these suggestions and collection of further details would enhance the findings. The scoring system

used in this study is easily applied, and other practices may find similarly thought-provoking results.

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### Acknowledgements

The following general practitioners participated in the study: D Ashley, P Barritt, D Bellamy, A Boonin, A Brown, J Buchanan, R Chase, D Coleman, D Condillac, J Draper, J Ferguson, K Harkin, W Holmes, C Jepson, K Jones, P Jones, A Lanerick, D Lister, T McCarthy, E McDwyer, S McEwan, L MacPherson, D Menin, S Mukherjee, B O'Farrell, S Pennell, S Pratt, P Rawes, K Reddy, R Sloan, G Smith, J Waldock and A Watson.

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