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## Correct inhalation technique is critical in achieving good asthma control

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The prevalence of asthma has been reported to range from 1 to 18% of the population in different countries.<sup>1</sup> This means that several hundred million patients with asthma rely on the efficacy of their inhalers to achieve asthma control. Undeniably, inhaled therapy remains the cornerstone of treatment for patients with asthma, and the main inhalation devices used are pressurised metered dose inhalers (pMDIs) and dry powder inhalers (DPIs).<sup>2</sup> Yet there are more than 200 different drug-inhaler combinations available in any medical formulary, and this causes immense confusion amongst prescribers, healthcare professionals and patients.

Published evidence shows that, when used correctly, there is little difference in clinical efficacy between different inhaler types.<sup>3</sup> However, several studies have reported that a high proportion of patients cannot use their inhalers (either pMDIs or DPIs) well enough to benefit from the treatment.<sup>4,5</sup> These numbers are even more depressing considering that between 40 to 85% of healthcare professionals, who should readily be able to teach patients how to use their inhalers correctly, do not seem to be able to perform that task properly – and doctors are the worst amongst all healthcare professionals.<sup>6-8</sup>

It has clearly been shown that failure to use inhalers correctly may result in poor asthma control,<sup>8</sup> increased cost,<sup>9</sup> and a greater risk to the patient from exposure to less well-tolerated alternative treatments. In a large cross-sectional study involving over 1600 asthma outpatients, the finding of just one critical error in inhalation technique, irrespective of the inhalation device (DPI or pMDI), was associated with increased emergency room visits, hospitalisation and oral medication prescription.<sup>10</sup>

In this issue of the *PCRI*, Levy and co-workers<sup>11</sup> retrospectively

evaluated pMDIs usage in a large cohort (nearly 4000) of UK primary care patients with asthma, and correlated patients' inhaler technique with the level of asthma control. Patients at British Thoracic Society (BTS) treatment steps 1, 2 and 3 had their asthma status reviewed through the Improving the Management of Patients Asthma and COPD Treatment (IMPACT) service, where specialist nurse advisors undertake asthma reviews in primary care according to protocols based on the UK BTS/SIGN National Asthma Guidelines.<sup>12</sup> Interestingly, part of the review involved evaluating pMDI inhaler technique objectively by using the Vitalograph Aerosol Inhalation Monitor,<sup>13</sup> a training device aimed at assessing three crucial steps needed for correct pMDI usage: slow inhalation flow (below 50 L/min); synchronisation between inhaler actuation and inhalation; and a 5 second breath-hold pause following inhalation.

The authors observed that patients who displayed significant errors when using pMDIs had higher risks of poor asthma control and more bursts of systemic corticosteroid prescriptions than those who operated pMDIs correctly.<sup>11</sup> Of note, patients who were using pMDIs in conjunction with spacers, or were using breath-actuated inhalers, had better asthma control than those using pMDIs alone. Synchronisation – i.e. achieving the correct inhalation flow following actuation – was the main step in the inhalation technique which most patients failed.

These findings should be interpreted in the context of the retrospective observational nature of the study. We do not know whether other reasons for poor disease control (e.g. co-morbidities, different treatment plans, different drug dosages) were more frequent in patients who misused their pMDI than those who used it correctly. In addition, the UK is rather atypical with respect to device prescription compared to the rest of Europe, where DPIs are the favoured inhalation device. In this current study, only 9% and 14% of patients, respectively, used their DPI as reliever, or maintenance, therapy. The investigators did not attempt to assess inhalation technique in the patients prescribed a DPI, nor did they relate DPI technique to asthma control. Certainly there is evidence to show that patients using DPIs may experience more critical errors than those using pMDIs.<sup>10</sup> Despite these limitations, the results of the study by Levy *et al.* are important: they confirm the relationship between inhaler misuse and poor asthma control, and reinforce the notion of the importance of patients training for efficient inhalation drug delivery.<sup>11</sup>

Patients' ability to handle inhalers correctly is a crucial issue for the choice of the most appropriate inhaler device for a given patient. Adherence to therapy is likely to be influenced by patients' attitudes and their experience in using the device, and if the patient feels that

their treatment is not working, adherence is likely to be poor with consequently reduced efficacy of treatment. Sometimes incorrect use of inhalers is not simply due to patients' lack of competence, but also to deliberate non-adherence by patients ('contrivance') who use their inhalers incorrectly.<sup>9</sup>

Despite the development of several new and improved types of inhaler device, there has been no sustained improvement over the past 35 years in patients' ability to use their inhalers.<sup>4</sup> The mantra for how to get patients to use inhalers correctly has been, and still seems to be: "training and more training".<sup>2</sup> Evidence shows that patients' competence in self-administration of inhaled medications is improved by educational interventions,<sup>14</sup> and repeated training in correct inhaler use improves asthma symptoms,<sup>15</sup> quality of life,<sup>16</sup> lung function,<sup>17</sup> and reduces the use of reliever medications as well as emergency hospital admissions.<sup>18</sup>

We advocate that choosing an inhalation device for drug administration in patients with obstructive airway diseases is as critical as the choice of medication itself, and that in future, the choice of a new compound will be secondary to the need to choose the appropriate inhaler device for the patient.<sup>19</sup>

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