

Stop using the flotation technique and start weighing salbutamol pressurised metered-dose inhalers without dose counters

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Abstract

Objectives: Salbutamol pressurised metered-dose inhalers (pMDIs) are not equipped with dose counters outside the USA. The aim of this study was to describe a simple reproducible method for determining the number of doses remaining in a pMDI based on scale weight.

Methods: Sixty salbutamol pMDIs (GlaxoSmithKline) containing 200 doses were bought in six European countries (10 pMDIs, with two source batches per country), including France (Ventoline®), Germany (Sultanol®), Italy, Spain, Switzerland and the United Kingdom (Ventolin®). A laboratory scale (Mettler Toledo XP204®) was used to weigh the canisters. Weights were also obtained with a digital kitchen scale used in our hospital (Ohaus CS 5000®) and one marketed for home use (IKEA Ordning®).

Results: With a laboratory scale, the mean weight of the canisters was 28.61 ± 0.10 g after priming and 14.84 ± 0.23 g after 200 puffs. Similar results were obtained with two common digital scales. There was a linear correlation between the mean weights of the canisters measured on the three scales ($r = 0.998$, $p < 0.0001$). Based on the results, a practical table was produced to determine whether pMDIs are empty or close-to empty.

Conclusions: As long as manufacturers neglect to equip all pMDIs with a dose counter, we recommend that the number of doses remaining in salbutamol pMDIs being checked by weighing the pMDIs on a common digital scale. Our results indicate that the canister should be replaced when its weight falls to ≤ 15 g.

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