demonstrated that sequential doses of metaproterenol at ten and 20-minute intervals produced greater bronchodilation than single doses. Oral candidiasis is a potential problem with inhaled corticosteroids. Slight hyperextension of the neck during inhalation may lessen the amount of steroid impacting in the mouth, and rinsing the mouth will decrease the amount of steroid remaining in the mouth after a dose.

The technique recommended by Newman and Clarke therefore should be expanded to include:

1. Assemble the device, remove the cap, and shake the inhaler thoroughly.
2. Breathe out slowly and fully to the end of a quiet breath.
3. Hold the MDI in the upright, inverted position (ie nozzle end down).
4. Place the mouthpiece between the lips or hold three to four cm from the mouth.
5. Hold the head upright and activate the MDI at the start of a slow and deep inspiration.
6. Hold the breath for ten seconds or, if less, as long as possible.
7. Exhale slowly.
8. Wait between doses (interval depends on the drug being administered).
9. Clean the plastic holder thoroughly and frequently.

If the patient is using an inhaled corticosteroid, the above steps should be modified to include:

a. Slightly hyperextend the neck during inhalation.
b. Rinse mouth/gargle with water after dose.
c. Use an inhaled sympathomimetic 10 to 15 minutes before the dose if the corticosteroid irritates the airways.

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REFERENCES

1 Hannan SE, Pratt DS, Hannan JM, Brienza LT. Foreign body aspiration associated with the use of an aerosol inhaler. Am Rev Respir Dis 1984; 129:1025-27
2 Newhouse MT, Ruffin RE. Deposition and fate of aerosolized drugs. Chest 1984; 86:342-44
4 Newmann SE, Pavia D, Clarke SW. How should a pressurized beta-adrenergic bronchodilator be inhaled? Eur J Respir Dis 1981; 62:3-20

To the Editor:

We strongly support Newman and Clarke's attempt (Chest 1984; 86:342-44) to improve and standardize metered dose inhaler (MDI) use. Only by teaching patients an optimum technique will maximum delivery of drug to the lung be achieved and most effective therapeutic results be obtained. In our opinion, aerosols should be inhaled from an MDI with the actuator mouthpiece held 4 cm in front of the open mouth. This method provides twice as much drug to the lower respiratory tract than when the MDI is placed between the closed lips. Furthermore, carefully controlled clinical trials have not shown the open mouth technique to be less effective and several have shown better bronchodilation when aerosol is delivered into the widely open mouth. With careful instruction (required in any case to utilize MDIs effectively), our patients have no difficulty with this method.

The one minute pause between MDI actuations, as recommended by the authors, is an arbitrary period and can be shortened considerably, particularly if patients are using steroid aerosols twice daily and must take large numbers of puffs on each occasion. Five to ten seconds should be quite sufficient to allow pressure equilibration in the canister and effective MDI dose.

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REFERENCES


To the Editor:

In the September issue of Chest, an editorial was devoted to the proper use of metered dose inhalers (MDIs) (Chest 1984; 86:342-44). Newman and Clarke analyzed different practical aspects of therapeutic interest and, finally, recommended a technique. We have previously reported the main clinical features of several asthma outbreaks in Barcelona. Although no mention was made on the proper use of MDIs, our studies gave us the opportunity to investigate the use of MDIs in a population of 88 patients attending the emergency room for treatment of acute severe asthma; moreover, the use of MDIs was checked following the same principles as those suggested by Newman and Clarke. Thus, we believe that our results can perfectly complement those presented in that editorial.

Fifty-four of the included patients (61%) used MDIs improperly. The most frequently observed error consisted in failure to hold the breath for 10 seconds (50%), practically the same proportion of subjects (54%) exhibited a marked inability to coordinate actuation of aerosol with inhalation, the so-called hand-lung problem. Other mistakes consisted in not breathing out fully (45%), and not shaking the inhaler thoroughly (33%). All patients removed the cap.

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