Is the MDI Doomed to Extinction?

Is the very successful brainchild of a 9-year-old asthmatic patient doomed to extinction? In 1956, the chlorofluorocarbon (CFC)-propelled metered dose inhaler (MDI) was introduced to the world as a result of a suggestion from this young child. The growth in sales of MDIs, for the purpose of administering drugs directly to the upper and lower airways, has been impressive. Currently, the MDI is used in vast quantities around the world to deliver various drugs to the airways. It is a most convenient, versatile, and cost-effective way to deliver aerosols.

However, the MDI has been challenged during its phenomenal growth period. Some of these challenges have caused only minor setbacks. With education and improved technology, these setbacks have been successfully overcome. The problem of MDI misuse was quickly dealt with by the dissemination of knowledge about the correct method of administration, as well as by the introduction of various add-on devices. The add-on devices have been successful in allowing the patient to separate the simultaneous motions of activation and inhalation, while in addition reducing the deposition of the drug in the pharynx. In this issue of Chest, Newman and Clarke report on a new device used to reduce the “cold Freon” problem from MDIs.

Unfortunately, there is a major roadblock to future MDI use which may not be overcome. The Montreal Protocol on CFCs has called for the elimination of these chemicals after 1995. Although the use of CFCs for medical use accounts for less than 1 percent of the total worldwide production of these compounds, the ban also applies to this usage. This ban is necessary to protect the ozone layer of our atmosphere. Even if CFC production for medical purposes is allowed to continue, it may prove to be economically unfeasible or too environmentally unpopular to be maintained. Thus, unless a suitable replacement for the CFC propellant in the MDI can be found, this remarkably useful device may be doomed to extinction. Chlorofluorocarbons are valuable as medical propellants because they are extremely well tolerated clinically and do not alter the drug that is being administered. Any new propellant has a large shoe to fill.

At present, there is a growing technology around self-propelled powdered dose inhalers (PDIs), which do not require CFCs. Current PDI products can deliver single or multiple doses. These delivery systems have the advantage that they are patient activated. In most cases the patient can achieve the inspiratory flow rates that are necessary to deliver the powdered drug to the lower airways. Desiccants can be added to the powdered drug to prevent moisture from clogging the system. Unfortunately, PDIs can cause throat irritation and may also result in increased drug delivery. Perhaps the PDI will replace the MDI if the latter is doomed to extinction. Only time and a vast clinical experience will tell.

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Ultrahigh Frequency Ventilation
Nouvelle Ventilation or Just Old Hash?

In this issue of Chest, Gluck and coworkers report the results of a multicenter study using high-frequency jet ventilation (HFJV) at a rate of approximately 300 breaths/min—a technique that they designate “ultrahigh-frequency ventilation” (UHFV). In patients with adult respiratory distress syndrome (ARDS) who met their definition of failing conventional ventilation, O₂ gas exchange improved and peak airway pressures were lower at 24 h after UHFV was initiated. Moreover, overall survival in this study was higher than in previous series of patients ventilated by conventional methods or with HFJV at lower frequencies. These are intriguing findings. However, because the study has major limitations, the results must be considered preliminary and therefore interpreted with caution.

Outcome was not an end point for this study. Hence, it is not known whether this technique actually will