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Editorial

The development of the first commercial metered dose inhalers (MDIs) was carried out by Riker Laboratories Inc., (now 3M Pharmaceuticals), in 1955 and marketing in 1956. Since that time, the MDI has become the preferred dosage form for the delivery of therapeutics to the respiratory tract to treat asthma and related diseases. The technology of this delivery system has evolved steadily over the period of mid 1950s to the mid 1980s. However, more recently, the pace of technological developments in the general field of drug delivery to the lungs has accelerated, primarily due to the phase out of the chlorofluorocarbon (CFC) propellants. The pharmaceutical industry has selected hydrofluorocarbon (HFC) propellants, some times called hydrofluoroalkanes (HFA) propellants, to replace the CFC blends used in MDIs.

The MDI is a relatively complex dosage form comprising the drug substance, the propellant, the surface active agent, the metering valve, the container, and the actuator. Changes made to any one of these components can affect the pharmaceutical performance of the inhaler. It is important to balance these factors in order to achieve the desired end result of consistently delivering the required quantity of the drug to the target site. Some of the new, non-CFC inhalers that became available over the last few years (Airomir™ Inhaler and Autohaler™, Qvar™ Inhaler and Autohaler™ marketed by 3M), have introduced significant improvements over the CFC inhalers, for example, greater dosing consistency (Purewal, 1998), a higher fraction of the delivered dose of drug in the fine particle size range (June and Schultz, 1995; Leach et al., 1996), maintenance of the inhaler performance at sub-zero temperatures. Other factors such as analytical methodology and manufacturing processes have also been improved.

There is still a high level of interest and activity in the general area of drug delivery to the lungs. This special issue presents some of the more recent research and development work, related to MDI systems, carried out by a number of different groups of scientists from pharmaceutical industrial and academic establishments. The importance of the modern MDI is likely to increase as the use of the respiratory tract as a portal-of-entry for therapeutic agents becomes more popular, such as for the delivery of potent analgesics (Purewal et al., 1993) and protein/peptide type of molecules.

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T.S. Purewal
3M Healthcare,
Loughborough,
Leicester,
LE11 1EP,
UK