

Fortunately, patients with a persistent air leak with or without a small pneumothorax are rarely encountered. We were pleased to hear about the successful experience of Mallen et al with autologous blood patch pleurodesis, and we feel that others will also be pleasantly surprised by something that is inexpensive and simple and that works.

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Substitution of Metered-Dose Inhalers for Hand-held Nebulizers

To the Editor:

The choice of a nebulizer system should not be only a question of costs, as Bowton et al¹ suggested in the February 1992 issue of *Chest*. Additionally, other objectives, such as ecological ones, should be considered. Recent studies, such as those of Bowton et al and others, indeed show that metered-dose inhalers (MDIs) are as effective as hand-held nebulizers and furthermore represent the cheapest way of administering aerosols to the lung. However, MDIs have some inherent problems: (1) they produce a great amount of disposable waste that cannot be recycled. (2) metered-dose inhalers still contain propellants, which contribute to damage of the ozone layer and may cause side effects to individual patients. Until the development of new inhalation systems that avoid negative ecological effects and still are as cost-effective as MDIs, consideration of individual factors, rather than general recommendations favoring one system, should lead to a balanced decision on an inhalation system.

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The Metered-Dose Inhaler Supersedes the Jet Nebulizer

To the Editor:

A large body of literature has developed to support the consensus that the metered-dose inhaler (MDI) should replace the jet nebulizer in hospital settings in view of its comparative therapeutic benefit and substantial cost-effectiveness. Pilot studies^{1,2} and two recent reports^{3,4} from tertiary hospitals have now demonstrated the feasibility of converting from the nebulizer to the MDI, primarily in patients not being cared for in an intensive care unit. Following such a conversion, the predicted financial annual saving for the 449 hospitals in the United States that have bed capacities over 500 (according to American Hospital Association figures for 1990s)

amounts to \$37,000,000, with a reduction in patient charges of \$134,700,000. (These figures are based on an annual hospital saving of \$83,000 and a lowering of patient charges of \$300,000.⁴ Others estimate hospital annual savings of \$2,000,⁵ \$43,758,³ and \$250,000.^{1,2} Actually, since there are also 6,200 hospitals in the United States with a bed capacity of less than 500, there is an even greater potential saving nationwide. Additionally, the time required by respiratory therapists to administer aerosol therapy is significantly reduced.

Nevertheless, a considerable amount of skepticism continues to exist, and we must be concerned with the possibility that inappropriate preliminary use of the MDI will hinder its acceptance or even lead to adverse outcomes. The most serious question raised by the doubting Thomases concerns the effectiveness of the MDI in treating critically ill patients in the emergency room and the intensive care unit. Settlement of this matter will require clinical studies to evaluate the efficacy of higher-dosage MDI regimens of beta-agonists and the optimal modes of delivering MDI therapy to patients on ventilators.

These facts suggest that there is an urgent need to carry out further studies evaluating MDI therapy in all hospital areas. Eventually, an authoritative committee report outlining accepted guidelines for making this conversion should be forthcoming. In this way, hospitals of all sizes will be able to institute this most cost-effective measure in a manner that will provide the best patient care.

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- 4 Bowton DL, Goldsmith WM, Haponik EF. Substitution of metered-dose inhalers for hand-held nebulizers. *Chest* 1992; 101:305-08
- 5 American Hospital Association hospital statistics. Chicago: American Hospital Association, 1992; 12
- 6 Berenberg MJ, Cupples LA, Baigelman W, Pearce L. Comparison of metered-dose inhaler attached to an Aerochamber with an updraft nebulizer for the administration of metaproterenol in hospitalized patients. *J Asthma* 1985; 22:87-92

Cough Syncope Induced by Enalapril

To the Editor:

It is well recognized that cough is commonly encountered in patients receiving angiotensin-converting enzyme inhibitor.^{1,2} Generally, it is considered to be a minor side effect, which subsides with cessation of the offending agent. We report the case of a patient who not only developed cough due to enalapril, but also suffered an episode of cough syncope.

A 55-year-old businessman was placed on a regimen of enalapril for essential hypertension. He was a lifetime nonsmoker, with no past history of rhinitis, asthma, or chronic respiratory illnesses. Within a few days, he developed a persistent dry cough, which did not respond to bronchodilators and antihistamines prescribed else-