LETTERS TO THE EDITOR

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We must take exception to the method used by King *et al.* in measuring dynamic compliance as cited in their article "Evaluation of PEEP Therapy in ARDS," *Canad. Anaesth. Soc. J.* 20: 547-558.

When tidal volume is divided by ΔP , where ΔP = peak airway pressure minus end-expiratory pressure, the result does not represent dynamic compliance but rather "effective compliance," a term which has recently been introduced into the pulmonary clinician's lexicon by Petty.¹

The designation of this parameter as a form of compliance is, in our opinion, unfortunate because the figure derived under the conditions described reflects the contribution of both compliance and airway resistance. Perhaps "impedance" would be a better term to use than "effective compliance." In on-line computer monitoring studies we have shown the component of pressure traceable to airway resistance to be both significant in magnitude and highly variable. In a study of the effects of PEEP, Falke *et al.* reported variations in dynamic compliance with application of successive increments of PEEP.²

Dynamic compliance was measured by the Mead-Whittenberger loop method, which is the conventional method for measuring compliance and permits one to separate out the effect of resistance. Alternatively, one might conceivably calculate dynamic compliance by utilizing a ventilator which incorporates an inspiratory pause, such as the Engstrom. By recording the upper airway pressure during the end-inspiratory pressure plateau phase, if such a phase were observed to occur, the component of pressure due to compliance could be separated out from the resistance component.

Actually, Dr. King and his colleagues could have achieved the same end with the MA-1 ventilator used in their study. The knob on the control panel labelled "expiratory resistance" can be actuated to delay the opening of the expiratory valve and institute an inspiratory pause. When that control is used, the operator should take note of the inspiratory:expiratory time ratio, however; we have found that low I:E ratios may result before the I:E ratio alarm is activated. This would be most hazardous in a patient whose cardiac output may already be compromised by the presence of PEEP.

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REFERENCES

1. PETTY, T.L. Respiratory failure in the coronary care unit. *Respiratory Care* 16: 292.
2. FALKE, K.J., PONTOPPIDAN, H., KUMAR, A., *et al.* Ventilation with end-expiratory pressure in acute lung disease. *J. Clin. Invest.* 51: 2315 (1972).