dose of relaxant to the muscle—presumably this might be an example of an increased "overall" tissue partition coefficient (a pharmacokinetic basis that is itself due to a change in pharmacodynamics). However, if increased blood levels during a steady state are needed for paralysis (pharmacodynamic basis), then the end-plate receptors must somehow be different as well as more numerous. This difference may be related in part to the interaction among the nerve terminals, the increased total number of innervated receptor sites and the relaxant molecules.

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Positive End-Expiratory Pressure (PEEP) and Renal Function

To the Editor:—We would like to comment on the recent review, "Respiratory Support and Renal Function," by Dr. Berry.[1] As indicated in the review, we previously had thought that the redistribution of flow from the cortical to the juxtamedullary nephrons might be an important contributory factor in initiating antidiuresis and antinatriuresis during ventilation with PEEP.[2] However, in a recent study[3] using the radioactive microsphere technique for the evaluation of intrarenal blood flow distribution,[4] we were unable to demonstrate any redistribution of renal blood flow during the ventilation with PEEP. The difficulties in reproducing and comparing results obtained by the inert gas washout method[5] with those obtained by the microsphere technique[4] have been summarized previously in detail.[6,7] The microsphere technique assesses glomerular perfusion, whereas the inert gas washout method assesses peritubular, postglomerular hemodynamic status which does not always reflect the intrarenal distribution of filtration. It is, therefore, unlikely that redistribution of renal blood flow plays an important role in the pathogenesis of the observed alterations in renal function during ventilation with PEEP.

In contrast to previous work,[8] we could also show that the fall in cardiac output ($\dot{Q}$) during PEEP was associated with a rise rather than a fall in transmural cardiac filling pressures. This confirms similar results of recent studies.[9,10] It is of interest to note that the blood transfusion of 25 ml/kg body weight during PEEP completely restored renal function despite the fact that $\dot{Q}$ had returned to only 70 per cent of its control value. This finding may be explained by the further increases in cardiac filling pressures following the transfusion which in turn caused the reflex suppression of low pressure volume receptors in the cardiac atria, baroreceptors in the aorta and carotid sinus, and the renal sympathetic nerves. These findings suggest that an adequate intravascular volume may be at least as important for maintaining normal renal function during ventilation with PEEP as a normal $\dot{Q}$ or perfusion pressure.

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A Simple Method for Mixing Air and Oxygen

To the Editor:—We were interested in the clinical report by Teeple and Pavlov which appeared in the December 1981 issue of *Anesthesiology.*[1] We have all been involved with neonates and been justifiably concerned with administering the proper inspired concentration of oxygen (F_{IO_2}). In this regard, the table provided by Teeple and Pavlov is very good and is the first one we have seen which deals with a 3-gas mixture. Frequently, however, one does not wish to utilize nitrous oxide but does desire to mix proper flows of oxygen and air so as to arrive at an F_{IO_2} between 0.20 and 1.0. Nomograms exist but are subject to being misplaced and somehow never seem to be handy when you need them.[2] We would like to describe a simple method to accurately determine the proper flow rates of oxygen and air when using a 2-gas mixture. The method is called Alligation Alternate.[3] Alligation applies to the mixing of liquids or solids in volume to volume or weight to weight proportions, respectively. It is useful if one has, for example, two liquids of the same chemical content but of differing percentage concentrations and wishes to compound a third liquid with a percentage concentration of that chemical between those two. This method is equally applicable to mixtures of gases. It can be performed quickly in the following manner (fig. 1).

One simply draws two vertical lines. On the left, the percentages of oxygen in the two gases to be mixed are indicated with the highest percentage at the top. In the middle the percentage of oxygen desired is written. In this illustration, we want to mix 100 per cent oxygen and room air (which we will presume to be 20 per cent oxygen for simplicity of calculation) to arrive at a mixture which contains 40 per cent oxygen. After placing the numbers in the appropriate locations, subtract diagonally from the lower number to the higher number. Thus, 20 from 40 is 20 and that number is placed in the upper right corner. Forty from 100 is 60 and that number is placed in the lower right corner. These two numbers indicate the proportions of the two known gases to flow in order to arrive at the concentration of 40 per cent. Thus, flowing 100 per cent oxygen and air in a 20:60 ratio will always result in a 40 per cent mixture.

It is important to realize with Alligation Alternate: 1) the concentration of gas desired must be somewhere between the concentrations of the gases to be mixed, and 2) the two gases being mixed should not undergo any chemical interactions. Our residents have found this method helpful and we felt we should pass it on to others.

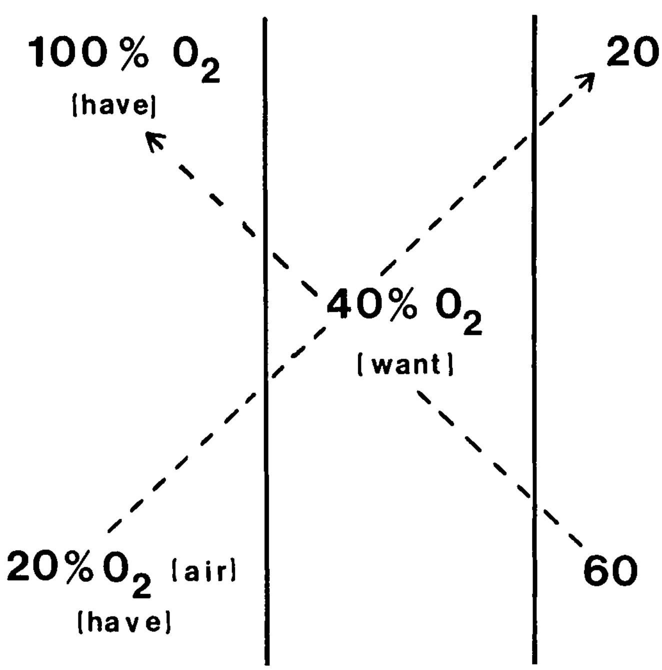

FIG. 1. Alligation Alternate.