EDITORIAL

Is Positive Pressure Breathing Over-rated?

More than two decades of experience with inhalation therapy have failed to resolve or even diminish the peculiar paradox in its evaluation. From its introduction in 1947 by Motley et al there has persisted a great skepticism, supported by careful and conscientious laboratory evaluation, that this modality has any physiologic value in the treatment of patients with chronic obstructive lung disease. During this same span of time, the sales and uses of pressure breathing equipment have skyrocketed throughout the medical world. It is paradoxical that many of the investigators, whose studies have indicated the ineffectiveness of this type therapy, admit to the continued use of IPPB by patients in their own practices.

For example, Curtis and co-workers recently reported that their study of long-term home treatment with IPPB in patients with chronic obstructive lung disease failed to demonstrate improvement in patients with chronic bronchitis and emphysema. In fact, their 78 patients under such treatment (average of more than four years) had FEV₁ values that deteriorated at a more rapid rate than the 109 controls. They added, however, that “almost all patients stated that the IPPB treatment helped them open their air passages and raise secretions. . . Most patients brought their own machines with them when they returned to the hospital for periodic check-ups.” This would support earlier studies by this same group that there is definite, though temporary, physiologic improvement from IPPB therapy, even without aerosol medication. Other studies, however, report negative findings for ventilation, blood gases, and even subjective effects.

Goldberg and Cherniack, also report that on the basis of carefully controlled studies, there is no difference between the beneficial effects of bronchodilator delivered by positive pressure breathing compared with the hand nebulizer. In the next sentence they add, however, that “the beneficial effects of the hand nebulizer would not be as great as that for IPPB in most patients with moderately severe respiratory distress and that bronchodilators delivered to these patients by IPPB would be of greater benefit.” These authors continue to use IPPB in the management of their own patients.

IPPB is also used extensively in surgical patients for the prevention of postoperative pulmonary complications. A controlled study of this objective was recently published by Baxter and Levine. They concluded that positive pressure breathing with normal saline or isoproterenol given prophylactically four times a day at 15 cm pressure to randomly selected patients after upper abdominal surgery did not reduce the incidence of pulmonary complications in those patients. The authors, however, continue to use this treatment, though in modified form. They suggest that the fault may not lie in the modality itself, but with the manner in which such treatment is provided for the individual patient.

The allergists have long been critical of inhalation therapy. As others, however, they continue to use it in their practice and it is uncommon to find an allergist’s office and/or hospital that does not have one or many of these machines available or in use. And so the paradox continues. Inhalation therapy it seems, is physiologically ineffective, but empirically useful. The literature is steadily increasing with reports that IPPB is both beneficial and useless, that ventilation is increased and decreased, that blood gases are favorably or unfavorably affected, and that patients are subjectively better or worse.

Several explanations have been advanced for these conflicting reports. The most readily available,
of course, is that the empiric results are all psychological. It is suggested that since they cannot be uniformly supported by confirming physiologic data, the effect is essentially that of a placebo. The assumption is, of course, that these objective laboratory measurements are capable of total evaluation of any given patient. The fault in the lack of agreement cannot be in the data, but in the patient himself. Yet, we all are familiar with the patient who has been able to improve his stair climbing from one to six or so flights without significant change in his physiologic measurements. Comparisons between such steady state and unsteady state evaluations are subject to serious questioning. One cannot help but wonder how complete such data can be in an individual who can improve his exercise tolerance so dramatically. It does lead one to consider whether our pulmonary function tests, for all their elaboration, may not provide less than adequate evaluation. The patient's own measurements may be more complete.

Akin to this "psychological" argument is that the manufacturers, in their eagerness to sell equipment, have influenced the patient into thinking he is improved. Maybe so. However, if one allows a patient to make his own choice between the less expensive hand nebulizer (with careful instruction) and the infinitely more expensive IPPB apparatus on the basis of his own therapeutic trials, many will prefer the IPPB equipment. In our experience at least, these patients have not been "conned."

A word about the manufacturers is also relevant at this point. Anyone intimate with the field of inhalation therapy cannot help but be impressed with the amount of time, money, and brains that the commercial people have devoted to pressure breathing developments. It is obvious from the tremendous improvement and sophistication in these pieces of equipment that the system of free enterprise has produced engineering dividends for the profession and their patients that probably never would have occurred otherwise. It is not surprising that the enthusiasm for their commercial developments may be somewhat more than objective.

Finally, as is true in any field where opinion varies so widely among competent and honest observers, it is possible that the differences may lie not in the equipment but in the way it is used. The indications and applications of it in the various clinical situations involving a host of different individual patients may be most crucial to its success or lack of success. Also, a clear definition of what is expected is vital to a proper evaluation of any mode of therapy. A trend of thought seems to be developing that nothing we have so far for treatment seriously alters the inexorable trend in the pathologic process of pulmonary emphysema. If one expects to accomplish permanent alteration with IPPB his evaluation is naturally colored by his unfamiliarity with the facts of the disease.

The question of whether pressure breathing is over-rated is like the old saw of whether sex is over-rated. It depends entirely on who answers the question and what his expectations are. It is certainly pertinent, if not conclusive, to question the indications for the use of IPPB, the mode of application, the individuals and the patients involved before categorically passing judgment on his rating of IPPB. Just as with digitalis and any other therapeutic agent of value, there are very specific indications and contraindications for the use of inhalation therapy. Two decades of experience have taught us that some patients are made much worse by such therapy, while others improve significantly, depending on the situation. We have also learned that there are rather specific techniques for successful administration. The well trained inhalation therapist or nurse-technician has been developed to fill this need. The details become more complicated and significant as experience increases.

The patient, too, offers significant variables which must be taken into account in prescribing IPPB therapy. It cannot be dispensed by rote any more than digitalis, or antibiotics, or other specific therapeutic measures. Success with inhalation therapy is intimately related to the engineering of air distribution in the pulmonary system. The variations of such in different patients with different degrees and types of pathology are literally infinite. Just as you don't buy the same pair of shoes for every member of the family, so the application of IPPB is critically dependent upon tailoring of the therapy to the specific patient and his individual pathology.

Most often the judgment on inhalation therapy is based only on its use in chronic chest disease type pathology. Some of its greatest value, however, lies in many of the more acute ventilatory problems, ie bronchitis and croup, neuromuscular paralysis, pharmacologic narcosis, chemical pneumonitis, acute pulmonary edema, the crushed chest, the mislabeled "shock lung," and other such entities.

The answer, then, to the continuing question of whether pressure breathing is over-rated becomes less simple as experience with it increases. New areas of usefulness, various forms of application (and modification of apparatus) are developing constantly, many of which are under-rated and under-used thus far. In others, misuse and overemphasis
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are prevalent. At this point evaluation can only be attempted for each individual patient after the indications and criteria for adequate therapy have been understood and adequate physiologic measurements have been established. And some of these apparently have not yet even been developed.

Crucial to the whole problem obviously is the individual who selects this therapy and directs its application. In the safety of the automobile, it is not so much the machine as the "nut" behind the wheel that is the determining factor. In inhalation therapy it is the physician responsible for its prescription and application that really determines its effectiveness.

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CREATIVE ART WITHOUT THREE DIMENSIONS

Neo-Assyrian sculptors and painters worked within the limits of the stylistic norms prescribed by conceptual art. Therefore, they drew not so much what their eyes saw, but what their minds selected as important or characteristic. On the plane surface, conceptual art presents the human body according to the following system: the head appears in its clearest aspect, in profile, but the eye is seen frontally — the clearest view of this part. The shoulders and the chest are presented frontally, while legs and feet appear in profile. This is not to be regarded as an unsuccessful attempt at representation. It amounted to an ideal representation of the human body. Adherence to conceptual representation is not a matter of the presence or the lack of skill; rather it reflects the affirmation of certain preferences to the exclusion of others. Artists chose to show the chest and shoulders frontally because this aspect displays these parts of the body most clearly and most "beautifully." The shift from conceptual to perspective vision was achieved by the Greeks in the course of cumulative development. In a period of two and a half centuries, from about 750 to 500 BC, the Greeks worked in a conceptual manner essentially like that of the Near East peoples and their own Minoan and Mycenean forerunners. Greek art owes its rich and creative development to the democratic structure of the city-state system. The intense commercial and artistic competition of the city-states and their citizens set a challenging series of tasks for the artists and workshops, promoting an organic development of artistic activity as a whole.


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