

right lung was similarly treated, with further improvement. It is felt that this treatment exerts its benefits by washing inspissated material from the tracheobronchial tree. (Wasserman, K., and others: *Lung Lavage (Alveolar Washing) in Alveolar Proteinosis*, *Amer. J. Med.* 44: 611 (April) 1968.)

**PULMONARY FUNCTION** Tests of pulmonary function were done before and at varying intervals after phrenic nerve section for phrenicofacial anastomosis in 14 patients with facial paralysis. Vital capacity decreased moderately postoperatively but by six months had returned to preoperative levels. Maximum breathing capacities and maximum flow rates were low preoperatively (probably due to difficulty in performing the tests due to facial paralysis) and improved postoperatively. Distribution of inspired gas, measured by the single-breath test, was unaffected by phrenic nerve section. Unilateral phrenic nerve section has remarkably little effect on ventilating capacity in subjects with normal lungs. (Fackler, C. D., and others: *Effect of Unilateral Phrenic Nerve Section on Lung Function*, *J. Appl Physiol.* 23: 923 (Dec.) 1967.)

**ELECTROPHRENIC RESPIRATION** Radiofrequency electrophrenic respiration (EPR) has been used successfully on a long-term intermittent basis to manage a patient with pulmonary hypoventilation. The ability to use it only when desired, to adjust the amplitude of stimulation, and to control the rate of stimulation externally, has been made possible by use of the technique of radiofrequency transmission. EPR by stimulation of one phrenic nerve was carried out each night for ten months in one patient. Moderate fatigue of the stimulated diaphragm could be demonstrated after ten hours of stimulation. Further observation is required to determine if such fatigue is progressive. The future uses of radiofrequency EPR may include any condition of hypoventilation associated with an intact phrenic nerve and diaphragm. (Judson, J. P., and Glenn, W. W. L.: *Radio-Frequency Electrophrenic Respiration. Long-term Application to a Patient with Primary Hypoventilation*, *J.A.M.A.* 203: 1033 (March) 1968.)

**CHEYNE-STOKES RESPIRATION** Patients who had congestive cardiac failure were divided into those having Cheyne-Stokes respiration (CSR), and those with normal respiratory patterns. Clinical, circulatory and ventilatory response factors were studied. Both groups had decreased cardiac indices but, in addition, those with CSR had circulation times twice those of patients without CSR. Inhalation of 2 per cent  $\text{CO}_2$  increased minute ventilation of patients with CSR and diminished the cyclic respiration. During breathing of air, alveolar carbon dioxide tension varied between 25 (hyperpnea) and 37 (hypopnea) mm Hg. Inhalation of 2 per cent  $\text{CO}_2$  resulted in cyclic  $\text{Pa}_{\text{CO}_2}$  variations of 31 to 36 mm Hg. Femoral arterial blood gases were completely out of phase with alveolar gas tension;  $\text{Pa}_{\text{O}_2}$  during hypopnea was 75 mm Hg while during hyperpnea it was 60 mm Hg.  $\text{Pa}_{\text{CO}_2}$  during hypopnea was 33 mm Hg while during hyperpnea it was 39.5 mm Hg. The primary determinant of periodic respiration in patients with heart disease is prolonged circulation time (greater than 25 seconds). When CSR is seen with shorter circulatory delays, increased neural excitability, anemia or hyperemia probably is implicated. (Lange, R. L., and others: *Observation and Stimulation of the Circulation, Acid-Base Balance, and Response to  $\text{CO}_2$  in Cheyne-Stokes Respiration*, *Circulation* 37: 331 (March) 1968.)

**TRANSTRACHEAL VS IPPB** The effectiveness of preventing postoperative pulmonary complications by instilling Alevair into the trachea through a percutaneous catheter was compared with intermittent positive-pressure ventilation in 50 patients. Of the 25 patients treated by the percutaneous catheter technique, one developed tracheobronchitis; the others were free of postoperative pulmonary complications. Of the 25 patients treated with IPPB postoperatively, ten developed pulmonary complications, including tracheobronchitis (1), atelectasis (4), pneumonitis (2) and severe pneumonia (3). (Rochlin, L.: *Percutaneous Endotracheal Catheterization and Intermittent Positive Pressure Breathing in the Prevention of Postoperative Pulmonary Complications*, *Amer. J. Surg.* 115: 333 (March) 1968.)

**ABSTRACTOR'S COMMENT:** The tenfold greater complications rate in IPPB patients makes one question how carefully the IPPB therapy was given. Where a study involves evaluation of IPPB therapy, documentation must be provided that the treatments were administered by adequately trained personnel. The author also makes no comment on the possible complications associated with the routine insertion of catheters through the cricthyroid membrane; e.g., hemorrhage and tracheal fistula.

**HYPOXIA** The path of oxygen from the environment to its ultimate destination in the mitochondria of the cells can be visualized as a series of steps forming a cascade from the inspired air to alveolar gas, arterial blood, systemic capillaries and, finally, the tissues and venous blood. Measurements of oxygen tension at specific stages of the cascade are used not only to pinpoint the primary site of hindrance to gas transfer but also to elucidate the pathophysiological causes for the disturbances in different forms of hypoxia. This approach is demonstrated with data from four clinical cases of patients who had different types of cardiopulmonary disorders, studied at an elevation of 5,300 feet. (*Luft, U. C., and Finkelstein, S.: Hypoxia: A Clinical-Physiological Approach, Aerospace Med. 39: 105 (Feb.) 1968.*)

**HYPOXIA** Use of a double-lumen oxygen-suction catheter is a predictably safe method for providing effective endotracheal suction. Oxygen washout by continuous suction is a theoretical problem in maintaining maximal arterial oxygen tension during suctioning, and probably accounts for some of the variability of increases in oxygen tension during the use of the double-lumen catheter. Effectiveness should be further increased, and higher arterial oxygen tensions maintained during suctioning, by modification of the suction apparatus to low volume, high flow, with a constant oxygen inflow. (*Berman, I. R., and Stahl, W. M.: Prevention of Hypoxic Complications During Endotracheal Suctioning, Surgery 63: 586 (April) 1968.*)

**HYPERBARIC O<sub>2</sub> IN TETANUS** Following the successful use of hyperbaric oxygen in *Clostridium welchii* infections, occasional cases of tetanus were treated by this method. Eight patients with severe tetanus were given a total of 19 hyperbaric oxygen treatments in a small one-man chamber. The two-hour treatments were complicated by spasms in the chamber which necessitated stopping six treatments early. After some treatments, there seemed to be some reduction in severity of the spasms, but more often there was no apparent effect on the disease. When CO<sub>2</sub> was added, the effect was more dramatic, resulting in cessation of spasms for from 12 to 16 hours. There is considerable hazard from CO<sub>2</sub> narcosis in these sedated patients, however, and one patient had respiratory arrest in the chamber. The mortality was six out of eight cases (75 per cent). (*Milledge, J. S.: Hyperbaric Oxygen Therapy in Tetanus, J.A.M.A. 203: 877 (March) 1968.*)

**PULMONARY FUNCTION TESTING** Exhaled nitrogen concentration and exhaled volume are commonly measured simultaneously to estimate anatomical deadspace and uniformity of distribution of inspired gas. Results of present study of healthy volunteers demonstrated that estimated deadspace was consistently lower and apparent distribution of inspired gas was more uniform during rapid exhalations. This was attributed to variation in sequence of lung emptying with different expiratory flow rates, and indicates the necessity to employ comparable expiratory flow rates for repeat studies in a given subject. (*Bashoff, M. A., and others: Effect of Expiratory Flow Rate on the Nitrogen Concentration vs. Volume Relationship, J. Appl. Physiol. 23: 899 (Dec.) 1967.*)

**AGING AND LUNG FUNCTION** At normal tidal volumes healthy elderly men exhibited a significantly higher degree of nonuniformity in intrapulmonary distribution of inspired gas than younger individuals. Functional residual capacity did not increase with age in this study and the observed nonuniformity in elderly subjects could not be ex-

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