

ABTRACTOR'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 cricothyroid 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 O₂ 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 CO₂ was added, the effect was more dramatic, resulting in cessation of spasms for from 12 to 16 hours. There is considerable hazard from CO₂ 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: 875 (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: 895 (Dec.) 1967.)

AGING AND LUNG FUNCTION At normal tidal volumes healthy elderly men exhibited a significantly higher degree of non-uniformity 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-

plained by increase in anatomical deadspace with age. A single forced exhalation prior to the nitrogen washout test used to measure uniformity of distribution of inspired gas significantly increased nonuniformity in elderly men but not in younger subjects. At large tidal volumes no age-dependent differences in intrapulmonary gas distribution occurred. It is postulated that lungs of old men are more susceptible to localized alveolar collapse than are the lungs of young men. (Edelman, N. H., and others: *Effects of Respiratory Pattern on Age Differences in Ventilation Uniformity, J. Appl. Physiol.* 24: 49 (Jan.) 1968.)

Kidney

RENAL FUNCTION Renal blood flow, function and oxygen utilization were studied in dogs chronically bled to hematocrits between 12 and 21 per cent. Total renal blood flow was not changed despite a marked increase in cardiac output, indicating that the kidneys did not show the vasodilatation of other organ systems in response to decreased oxygen supply. Glomerular filtration and sodium resorption were reduced markedly although sodium resorption in relation to filtrated load was unimpaired. Total oxygen consumption remained normal. Since the sodium resorption process is the major oxygen consumer in the kidney, the decrease in sodium resorption probably accounts for the normal total oxygen consumption noted. The reduced glomerular filtration rate may have resulted from preglomerular vasoconstriction and decreased postglomerular resistance, due to either vasodilation or decreased blood viscosity, or both. The blood-tissue PO_2 gradient was increased, indicating greater extraction of oxygen. Thus, the anemic dogs were able to maintain normal renal function by decreasing the work load (glomerular filtration and sodium resorption) and by more efficient extraction of oxygen. (Aperia, A. C., and others: *Renal Adaptation to Anemia, Circ. Res.* 22: 489 (April) 1968.)

FETAL RENAL FUNCTION Effects of infusion of hydrochloric acid (HCl) were studied in near-term fetal and newborn lambs. In both fetus and neonate, HCl infusion produced the expected changes in blood acid-base characteristics. However, urinary pH and excretion of titratable acid and ammonia did not change significantly until the acid dose per unit weight was about three times that required in adult animals. Cardiovascular effects of the acid load were negligible. The fetal and early neonatal kidney is limited in its ability to acidify the urine and to excrete acids, and in the fetus the placenta probably excretes the largest portion of the acid load. Other studies show that in the human the ability to acidify the urine and excrete acid is acquired a few days after birth. In view of the minimal cardiovascular response to acid infusion, arterial pH may not be the best indicator of neonatal physiological status. (Vaughn, D., and others: *Fetal and Neonatal Response to Acid Loading in the Sheep, J. Appl. Physiol.* 24: 135 (Feb.) 1968.)

Muscle

TUBOCURARINE Tubocurarine chloride was given on a body-weight basis to 30 patients undergoing surgery and the electromyograph was monitored. No precise relationship was found between the dose of tubocurarine administered and the degree of paralysis observed. Reversal of neuromuscular blockade was then accomplished with incremental doses of neostigmine methylsulfate. The optimum dose of neostigmine required to establish complete reversal of severe neuromuscular blockade due to tubocurarine was about 4 to 5 mg. This reversal could be achieved satisfactorily even when the time interval between the relaxant and antidote was only a few minutes. (Bridenbaugh, P. O., and Churchill-Davidson, H. C.: *Response to Tubocurarine Chloride and Its Reversal by Neostigmine Methylsulfate in Man, J.A.M.A.* 203: 541 (Feb.) 1968.)