

PULMONARY DIFFUSION In a study of 24 normal subjects pulmonary diffusing capacity at rest and at exercise was found to decrease with increasing age. This decrease in pulmonary diffusing capacity is probably explained by a diminution in cardiac output with increasing age. (Donevan, R. E., and others: *Influence of Age on Pulmonary Diffusing Capacity*, *J. Appl. Physiol.* 14: 483 (July) 1959.)

RESPIRATION CONTROL Using a technique in anesthetized dogs by which either the alveolar carbon dioxide tension or the arterial hydrogen ion concentration can be held constant while the other factor was altered the author studied their effects on respiration. It was found that both infusion of 0.5 M hydrochloric acid and the addition of carbon dioxide to the inspired gas were potent respiratory stimuli and their effects may be considered essentially separate and additive. (Domizi, D. B., Perkins, J. F. Jr., and Byrne, J. S.: *Ventilatory Response to Fixed Acid Evaluated by 'Iso-PCO₂' Technique*, *J. Appl. Physiol.* 14: 557 (July) 1959.)

PULMONARY FUNCTION The effect of minute ventilation and pulmonary blood flow on the diffusing capacity of the lung for carbon monoxide was investigated at rest and during exercise by steady state methods. Normal subjects were contrasted with patients in whom pulmonary blood flow had been restricted by mitral stenosis. Voluntary hyperpnea and unilateral occlusion of a pulmonary artery were employed to vary ventilation and blood flow independently. Diffusing capacity for carbon monoxide is little influenced by changes in pulmonary blood flow until flow is markedly reduced. Increases in ventilation are associated with increases in diffusing capacity and seem to account for the rise in diffusing capacity seen in moderate exercise. (Turino, G. M., Brandfonbrener, M., and Fishman, A. P.: *Effect of Changes in Ventilation and Pulmonary Blood Flow on Diffusing Capacity of Lung*, *J. Clin. Invest.* 38: 1186 (July) 1959.)

RESPIRATORY FUNCTION TEST A simple, semiquantitative test for airway obstruction is based on the patient's ability, by

maximal expiration, to extinguish a match held 6 inches from the open mouth. Results of this test can be correlated with those of the one-second vital capacity and the maximum breathing capacity tests. Eighty per cent of the patients with a maximum breathing capacity above 60 liters per minute could extinguish the match, while the same proportion of those with a maximum breathing capacity below 60 liters per minute could not. Eighty-five per cent of those with a one-second vital capacity above 1.6 liters could extinguish the match, while the same proportion with a one-second vital capacity below 1.6 liters could not. Occasionally, patients with restrictive pulmonary disease will give results similar to those found in airway obstruction. Therefore, this test should be used only as a screening procedure; if results are abnormal, more specific tests of pulmonary function should be performed for exact diagnosis. (Snider, T. H., and others: *Simple Bedside Test of Respiratory Function*, *J. A. M. A.* 170: 1631 (Aug. 1) 1959.)

COMPLIANCE Sixteen patients age 19 to 64 years were subjected to resection of 1 to 8 segments of lung tissue. Compliance was measured preoperatively and postoperatively. When expressed as the percentage of the control value, there was a consistent correlation between the reduction in compliance and the number of segments removed. It is felt that this reduction in compliance is due to a reduction in the number of elastic units participating in ventilation. (Frank, N. R., and others: *Effect of Pulmonary Resection on Compliance of Human Lungs*, *J. Thoracic & Cardiovascular Surg.* 38: 215 (Aug.) 1959.)

RESPIRATORY UNIT A unit has been set up at the Toronto General Hospital for the treatment of severe respiratory insufficiency. The unit is staffed by a team of 4 physicians (including an anesthetist) and a permanent group of specially trained nurses. Ventilation in all patients treated by the unit is maintained by the technique of intermittent positive pressure respiration, usually through a tracheostomy. The patient's trachea is separated from the nasopharynx by an inflatable cuff around the tracheostomy tube. The establishment of this special hospital unit has resulted in more

efficient treatment or respiratory insufficiency patients; complications of this type of therapy have been reduced, and more satisfactory survival rates and rehabilitation obtained. (Barber, H. O., and others: *Respiratory Unit. The Toronto General Hospital Unit for Treatment of Severe Respiratory Insufficiency*, *Canad. M. A. J.* 81: 97 (July 15) 1959.)

HYPOTHERMIA Laboratory studies and clinical experiences support the concept that hypothermia may be beneficial in portacaval shunt operations upon patients with diffuse, severe hepatocellular disease. Successful results are reported in 5 elective and 5 emergency, postcaval shunt operations under hypothermia. Immersion hypothermia with temperatures stabilized at 30 C. was employed often with pentothal-cyclopropane induction anesthesia. (Clauss, R. H., and others: *Hypothermia for Portacaval Shunts*, *Ann. Surgery* 150: 99 (July) 1959.)

HYPOTHERMIA Adult rats and mice that were cooled quickly below 11 C. core temperature usually ceased to breathe. Suspension of breathing and heartbeats were tolerated at 2 C. for one hour, whether artificial breathing was given or not and whether air or nitrogen filled the lungs. At heart temperatures of 10 C. where heart beat was maintained, rats survived if artificial ventilation with nitrogen was provided for 0.4 of an hour or if ventilation with air was provided for two hours. The limitation of times less than 1.5 hours was imposed mostly by anoxia. (Adolph, E. F. and Goldstein, J.: *Survival of Rats and Mice Without Oxygen in Deep Hypothermia*, *J. Appl. Physiol.* 14: 599 (July) 1959.)

HYPOTHERMIA Fifteen out of 33 dogs subjected to hypothermia produced by external cooling survived circulatory arrest of 45 minutes during which the average temperature reached was 19.6 C. The anesthesia was produced with cyclopropane, during the early part of the cooling. Each animal was slightly hyperventilated with 100 per cent oxygen. Before the cooling was completed, the animals had received a mixture of mepazine and in some cases potassium chloride in a 5 per cent

solution. Mepazine produced slowing of the heart, prolongation of conduction within the ventricle, and decreased myocardial irritability. Potassium chloride prevented severe pH drop. It was considerably more difficult to restore sinus rhythm following complete cardiac standstill than in those instances in which the heart still beat occasionally. (Corssen, G. G., and others: *Pharmaco-Dynamic Management of Cardiac Action During Hypothermia*, *South. M. J.* 52: 1009 (Sept.) 1959.)

HYPOTHERMIA During the induction of hypothermia in 10 anaesthetized patients the electrocardiogram regularly revealed an extra, slowly inscribed deflection (J. deflection) in the early part of the ST segment which grew in size as the temperature fell. Finally the T wave became inverted. The J deflection was also observed during experimental hypothermia in dogs. The time of appearance was unrelated to body temperature or arterial blood pH, and there was no correlation between time of onset or severity of changes and the onset of ventricular fibrillation. (Emslie-Smith, D., Sladden, G. E., and Stirling, G. R.: *The Significance of Changes in Electrocardiogram in Hypothermia*, *Brit. Heart J.* 21: 343, 1959.)

DRUG PLASMA LEVELS Plasma concentrations of thiopentone and buthalitone in human subjects were followed for 24 hours after intravenous administration. Buthalitone was distributed to the tissues more rapidly but was metabolized at a slower rate than thiopentone. The relationships between these findings and differences in plasma protein binding and oil/water partition coefficients were studied. It was suggested that some of the differences observed in potency between the substances is a reflection of differences in their modes of distribution. There appears to be a tendency for more thiopentone to enter the brain but more buthalitone appears to enter the tissues generally. No relationship was found between speed of recovery from anesthesia and plasma barbiturate concentrations. (Kane, P. O., and Smith, S. E.: *Thiopentone and Buthalitone: Relationship Between Depth of Anesthesia, Plasma Concentration and Plasma Protein Binding*, *Brit. J. Pharmacol.* 14: 261 (June) 1959.)