

cases a mixture of 98 per cent oxygen and 2 per cent carbon dioxide was used. In the first series carbon dioxide tension is maintained near normal. The fall in pH was consistent with the development of metabolic acidosis. The addition of carbon dioxide during perfusion superimposes a respiratory acidosis on top of the metabolic acidosis. Some patients had low P_{CO_2} levels presumably due to hyperventilation. Even in those patients with a P_{CO_2} of less than 20 mm. Hg, no electroencephalographic abnormalities were noted. (Viles, P. H., and others: *Effect of Two Per Cent Carbon Dioxide on pH and P_{CO_2} During Extracorporeal Circulation*, *J. Thoracic & Cardiovasc. Surg.* 39: 619 (May) 1960.)

WHOLE BODY PERFUSION During high flow, normothermic whole body perfusion, studies were made of certain hemodynamic and metabolic variables in 3 patients. At the outset of perfusion, mean arterial pressure was subnormal and rose gradually with an increase in the peripheral vascular resistance. Steady levels of venous pressure were noted. The partial pressure of carbon dioxide was maintained at a lower than normal level. The system of perfusion used caused no significant increase in metabolic acidosis over that seen during pre-perfusion anesthesia. Oxygen consumption was within normal limits for anesthetized man. (McGoon, D. C., and others: *Physiologic Studies During High Flow, Normothermic, Whole Body Perfusion*, *J. Thoracic & Cardiovasc. Surg.* 39: 275 (March) 1960.)

EXTRACORPOREAL CIRCULATION

Three hundred intracardiac operations were performed with extracorporeal circulation. In 262 cases, cardiac arrest was produced by injection of acetylcholine into the coronary system. Cyclopropane induction is followed by ether anesthesia. Tracheotomy is rarely performed in patients with pulmonary hypertension since pharyngeal secretions enter the lungs around the tube and 90 per cent of the respiratory resistance is due to organs below the cricoid cartilage. In view of the importance of the larynx for the cough reflex, tracheotomy is used only in patients who are too weak for active expectoration. About 2,500 cc. of blood/square meter of body sur-

face are circulated in one minute. Postoperative fluids are limited in the first 24 hours to 250 cc. or less for children, and to 500 cc. for adults. This is believed to reduce the incidence of cerebral and pulmonary edema. (Beyer, H. A.: *Anesthesia for Open Heart Operations Using Heart Lung Machine*, *Der Anaesthetist* 9: 117 (April) 1960.)

CARDIAC WOUNDS One hundred cases of penetrating injury to the myocardium are reported. The most urgent problems were hypotension due to loss of blood, cardiac tamponade due to hemopericardium, and hypoxia due to pneumothorax or hemothorax. Cyclopropane, with or without other anesthetics, was used in 74 cases because of the quick, quiet induction it afforded. Intubation of the trachea was done as soon as possible to assist respiration, and then thoracotomy in order to relieve cardiac tamponade or to stop hemorrhage. (Schaefer, H. C., and DeVault, M.: *Anesthetic Management of Penetrating Wounds of Heart*, *J. A. M. A.* 172: 1913 (April 23) 1960.)

HEMORRHAGE AND HEALING Following acute hemorrhage, there is delayed wound healing. Restoration of normal blood volume reduces but does not prevent the delay. Denervation of the wounded area eliminates the delay in healing. It is postulated that local vasospasm persists and prevents normal healing; this is eliminated by denervating the area. The hemoglobin level has little influence on wound healing; restoration of blood volume by use of plasma is satisfactory. This paper is not concerned with the other physiological functions of hemoglobin. (Sandberg, N., and Zederfeldt, B.: *Influence of Acute Hemorrhage on Wound Healing in Rabbit*, *Acta chir. scandinav.* 118: 367 (April) 1960.)

ECG AND VALSALVA MANEUVER In 209 demonstrably healthy subjects, the Valsalva maneuver was performed at 40 mm. Hg for 10-12 seconds, while recording the electrocardiogram. In 22.5 per cent of the cases abnormalities developed. This is due to a low cardiac output with minimal coronary artery perfusion. (Schafstel, N., and others: *Electro-*

cardiographic Changes Produced by Valsalva Maneuvre in Healthy Adults. Amer. J. Cardiol. 5: 473 (April) 1960.)

BLOOD COAGULATION The erythrocytes contain a clotting factor which seems to enter into a reaction for the formation of thromboplastin. This substance does not seem readily available for use except when the erythrocytes become damaged. With damage, however, this substance, called erythrocytin, is readily available to enter into the clotting mechanism and does not require preliminary activation as do platelets. (*Quick, A. J.: Influence of Erythrocytes on Coagulation of Blood, Amer. J. Med. Sci. 239: 51 (Jan.) 1960.*)

PLASMA EXPANDERS Three procedures for processing human plasma incorporate heat treatment for 10 hours at 60 C. in the presence of suitable stabilizers to inactivate the virus of hepatitis. The reprocessed, heat-treated plasma preparations fall into three classes: (1) heated whole plasma from which little fibrinogen has been removed, (2) partially fractionated materials from which gamma globulin, fibrinogen and some lipoproteins have been removed and (3) albumin solutions. In many cases these plasma expanders show evidence of major changes in their electrophoretic and ultracentrifugal patterns. Because high molecular weight aggregates and some denatured albumin-globulin complexes are formed during the preparation of these expanders, it has been demonstrated that these preparations contain a new antigen not present in the unheated materials. Immunization of volunteers with the human plasma preparations in several instances led to the appearance of reactions. It is difficult to attribute the reactions to any one antigen. (*Maurer, P. H., and Subrahmanyam, D.: Immunological Studies with Plasma Expanders Derived from Human Plasma, J. Clin. Invest. 39: 698 (April) 1960.*)

SHOCK Studies of myocardial metabolism of 18 intact dogs revealed an abnormal metabolic pattern during hemorrhagic shock which was alleviated by blood transfusion but not by *l*-norepinephrine. It is believed that the reason that *l*-norepinephrine treatment does not

increase survival rate of dogs is because it fails to correct the fundamental metabolic abnormality which, at the same time, imposes a heavier burden of work on the heart. (*Hackel, D. B.: Effects of L-Norepinephrine on Cardiac Metabolism of Dogs in Hemorrhagic Shock, Proc. Soc. Exp. Biol. & Med. 103: 780 (April) 1960.*)

BLOOD STORAGE Human or ox blood, diluted to a 40 per cent increase in volume, rapidly frozen and stored for one year in liquid nitrogen, and periodically examined, showed a gradual loss of oxygen capacity of 2.5 per cent, of which 0.5 per cent represented conversion to methemoglobin. An immediate hemolysis of 5 to 6 per cent took place due to freezing and thawing—which was doubled during the year. Potassium accumulation in plasma due to escape from intact cells and to liberation from hemolyzed erythrocytes was either stopped or nullified by a reversed migration of the K-ion to the cells. (*Sendroy, J., Jr., and O'Neal, J. D.: Oxygen Capacity of Stored Frozen Blood, Proc. Soc. Exp. Biol. & Med. 103: 760 (April) 1960.*)

PULMONARY FUNCTION TEST A simple rapid method employing helium is presented for estimating functional residual capacity of the lungs. It is not expensive and is useful for a variety of other tests of pulmonary function. The results are highly reproducible and are not subject to a significant systematic error. (*Mensely, G. R., and others: Simplified Closed Circuit Helium Dilution Method for Determination of Residual Volume of Lungs, Amer. J. Med. 28: 824 (May) 1960.*)

PULMONARY FUNCTION Alterations in pulmonary mechanics occur in man when an inspiration is taken from below the resting lung volume and during shallow breathing. A study of pulmonary function changes in 25 normal subjects whose chests were tightly bound in the expiratory position resulted in a reduction in the total lung capacity and its subdivisions. Lung pressure volume relationship was altered, a smaller volume resulting per unit pressure, over much of the vital capacity. There was slight uneven distribution of inspired gas and a small quantity of very