

riers are secondary. The barrier functions of the fetus are not very pronounced. Experiments on kittens whose eyelids were sutured together, showed that in the process of barrier property formation the effect of an adequate stimulus is very important. Experiments on the stimulation of different nerves showed an increase of the permeability of the barrier. (From the book: *Zaiko, N. N., and others: Use of Tagged Atoms in Study of Barrier Functions in Organism, Trudy vsesoyuznoi konferentsii po meditsinskoj radiologii pp. 228-232, 1957.*)

CEREBRAL CIRCULATION Cerebral vasomotor change was recorded by an adaptation of the plethysmographic technique. Increase in amplitude of cerebral pulse volume, accompanied by an increase of intradural volume, occurs in response to the inhalation of a mixture of carbon dioxide 5 per cent and oxygen 95 per cent. A similar change is seen in response to voluntary apnea, sleep, voluntary facial nerve activity, superior cervical ganglion block, and intravenous administration of alcohol or papaverine. This is considered to be cerebral vasodilatation. The reduction of pulse volume amplitude with a reduced intradural volume is the observed response to hyperventilation, abdominal and cutaneous pain, and stimulation of the middle or superior cervical ganglion. This is considered to be cerebral vasoconstriction. The administration of nicotinic acid, performance of mental work, and electrical stimulation of the stellate ganglion produce no effect on cerebral vasomotor activity. The craniocervical sympathetic system whose fibers accompany the vagus nerve to the superior cervical ganglion has been shown to subservise cerebrovascular activity. This system is separate from the thoracolumbar sympathetic outflow. (*Bridges, T. J., Clark, K., and Yahr, M. D.: Plethysmographic Studies of Cerebral Circulation: Evidence for Cranial Nerve Vasomotor Activity, J. Clin. Invest. 37: 763 (May) 1958.*)

CEREBRAL CIRCULATION Aging is associated with a decrease in cerebral blood flow and oxygen consumption and an increase in cerebrovascular resistance. There is no good correlation between cere-

bral blood flow or cerebral oxygen consumption and the patient's mental status. Inhalation of 5 to 7 per cent carbon dioxide is the most potent and possibly the only selective means of causing cerebral vasodilatation and increasing cerebral blood flow. The length of time that cerebral vasodilatation mediated by inhalation of carbon dioxide can be maintained is unknown. Effects of other agents used in an effort to obtain selective cerebral vasodilatation are inconsequential when compared to effects of carbon dioxide. The response of cerebral circulation to fall in blood pressure is fairly consistent and independent of the etiology of that fall in pressure. As blood pressure is reduced, cerebral vascular resistance is reduced proportionately, tending to maintain cerebral blood flow. At some point, maximum dilatation is reached and fall in cerebral blood flow accompanies any further reduction in blood pressure. As blood flow falls cerebral oxygen consumption is maintained by increased extraction of oxygen from the available blood. Aminophylline is unique in its ability to cause cerebral vasoconstriction with a consequent increase in cerebral vascular resistance and a decrease in cerebral vascular blood flow. (*Novack, P., and Goluboff, B.: Cerebral Circulation and Metabolism of Aging, Geriatrics 13: 285 (May) 1958.*)

AMINOPHYLLINE The cardiovascular effects of intravenously administered aminophylline were studied in 11 patients with moderately severe pulmonary emphysema. The drug caused an increase in minute ventilation, a decrease in arterial CO_2 and no change in the resting reduced arterial oxygen saturation. There was a slight increase in oxygen consumption, a widening of the arteriovenous oxygen difference and a decrease in cardiac output. Cardiac rate increased, mean brachial artery pressure decreased as did stroke volume and left ventricular work. Peripheral resistance did not change. Coronary blood flow decreased with a widening of myocardial arterio-venous oxygen difference. There was no change in myocardial oxygen consumption, myocardial respiratory quotient, or in coronary vascular resistance. Left ventricular efficiency decreased. It is concluded that while amino-

phylline improves the ventilatory status of the patient with emphysema, it causes deleterious effects on the cardiovascular system. (Christensen, R. C., and others: *Effects of Aminophylline on Coronary and Peripheral Circulation in Patients with Emphysema*, *J. Clin. Invest.* 37: 884 (June) 1958.)

WATER DIURESIS The role of anesthetic agents in diuresis inhibition was studied in 19 female patients. Diuresis was induced prior to preanesthetic medication by the rapid infusion of 5 per cent dextrose and water. Atropine was given without effect on the diuresis. Induction with ether, nitrous oxide or cyclopropane regularly caused abrupt and long lasting inhibition of the established diuresis. Induction with thiopental was without effect. Patients anesthetized with the latter agent continued diuresis during the addition of any one of the three inhalation agents. Water diuresis during thiopental anesthesia could be inhibited by intravenous vasopressin and subsided spontaneously when water loading was terminated. These data suggest the possible use of thiopental to avoid susceptibility to water intoxication in the surgical patient during and after operation. (Arahamian, A. H., and others: *Effect of Anesthetic Agents on Water Diuresis*, *J. Clin. Invest.* 37: 875 (June) 1958.)

BARBITURATES A comparative study of the rate of penetration into the brain of thiopental, pentobarbital, barbital, and phenobarbital was made in dogs. Thiopental passed more readily into the brain than did the other three barbiturates. This was correlated with the onset of hypnoic effect and also with the difference in relative lipid solubilities between the barbiturates. (Mark, L. C., and others: *Passage of Thiobarbiturates and Their Oxygen Analogs into Brain*, *J. Pharmacol. & Exper. Therap.* 123: 70 (May) 1958.)

PENTOBARBITAL ANESTHESIA The effect of acetylsalicylic acid, aminopyrine, morphine, phenylbutazone and prednisone on duration of hypnosis and brain barbiturate concentrations in pentobarbital anesthesia in mice has been determined. Only aminopyrine and phenyl-

butazone significantly increased the brain barbiturate concentration and prolonged pentobarbital hypnosis. (Eckhardt, E. T., Grelis, M. E., and Tabachnick, I. I. A.: *Effect of Some Analgesic and Anti-inflammatory Agents on Sodium Pentobarbital Anesthesia*, *Proc. Soc. Exp. Biol. and Med.* 98: 423 (June) 1958.)

HYPOTHERMIA The use of hypothermia induced by a continuous flow of cold water through an intragastric balloon is described in two patients undergoing neurosurgical procedures. In one patient, the body temperature was lowered to 31.5 C. in 90 minutes. The method proved simple, easy to manage, and very effective. Rewarming can be begun more promptly than with any other method. (Khalil, H. H.: *Hypothermia By Internal Cooling in Man*, *Lancet* 1: 1092 (May 24) 1958.)

HYPOTHERMIA Dogs cooled as long as four hours (23-24 C.) and then rewarmed showed a prompt return of hematocrit to precooling control levels. After 8-12 hours of cooling the hematocrit and blood and plasma specific gravity continued to fall below normal levels. Prolonged blood clotting time occurred during hypothermia of 2-4 hours, and promptly returned to normal clotting time upon re-warming. However, the blood clotting time is considerably prolonged after 8-12 hours of cooling. No significant changes occurred in the prothrombin time. Rewarming after hypothermia of 2-12 hours did not result in any significant changes in electrolytes, acid-base balance, blood sugar and amino acids or lactate/pyruvate ratio. It is concluded that six hours of hypothermia and subsequent re-warming is not clinically hazardous for the danger of ventricular fibrillation. (Fisher, B., Fedor, E. J., and Lee, S. H.: *Rewarming Following Hypothermia of Two to Twelve Hours*, *Ann. Surg.* 148: 32 (July) 1958.)

HYPOTHERMIA IN ASPHYXIA A study of the effects of deep hypothermia on the cardiac activity of a premature human fetus showed: (1) The full-term human infant can tolerate lower temperatures than the adult, and the premature infant is even more resistant to cold. (2) Carbon dioxide has several physiological effects