"WORK IN PROGRESS" ABSTRACTS

Following are abstracts of papers presented at the WORK IN PROGRESS program of the Annual Meeting of the American Society of Anesthesiologists, Inc., Miami Beach, Florida, October 8 and 9, 1959.

The Effect of Inhalation Anesthetics on Cerebral Hemodynamics and Metabolism. SOLOMON N. ALBERT, M.D., CHALOM A. ALBERT, M.D., AND JOSEPH F. FAZEKAS, M.D. *Department of Anesthesiology, District of Columbia General Hospital, Washington, D. C.* The development of a procedure in which Krypton-85, a radioactive gas, is substituted for nitrous oxide, has made possible the study of the effect of gaseous agents on cerebral hemodynamics and oxygen consumption (*Lasser, N. A., and Munck, O.: Acta physiol. scandinav. 33: 30, 1955*). Studies were made on a limited number of patients undergoing surgery with diethyl ether alone and cyclopropane, with and without barbiturates. Mean arterial pressure was measured by a damped aneroid manometer attached to the femoral artery needle. The rate of cerebral blood flow was determined by a simplified Krypton-85 procedure (*Albert, S. N., and others, to be published*), whereby cerebral tissue is rapidly saturated with Krypton-85, and the rate of elimination of this gas in cerebro-venous blood is measured. Blood samples were drawn at the termination of the saturation period from the internal jugular bulb at one-minute intervals for five minutes and analyzed by radioactive methods for the relative concentrations of Krypton-85. Blood samples drawn simultaneously from the femoral artery and jugular bulb at the time of blood flow determination were also analyzed for carbon dioxide, oxygen, and glucose content. Cerebral electrical activity was continuously monitored on a single-channel electroencephalograph recorder. Control determinations prior to induction of anesthesia and experimental observations when the subject reached third plane of surgical anesthesia. *Cyclopropane:* Three unpremedicated patients showed no apparent change in the total cerebral metabolic rate. *Barbiturates and cyclopropane:* Induction with thiobarbiturate reduced cerebral oxygen consumption, but this effect did not seem to be carried over with cyclopropane into the experimental stage. Simultaneous administration of small doses of thiobarbiturates and cyclopropane suggests a potentiation of their effects indicated by a reduction of cerebral oxygen consumption. *Diethyl ether:* No change was noted in cerebral oxygen consumption. The loss of consciousness with cyclopropane or diethyl ether to a stage of surgical anesthesia did not significantly influence cerebral oxidative processes in terms of total cerebral metabolic rate. This may be due to a process of "uncoupling" (*Bain, J. A.: Fed. Proc. 12: 653, 1952*) or to a selective action on a specific limited area of the brain not demonstrable in studies on total cerebral metabolic rate. It has been demonstrated by recording electrical activity from various areas in the brain that the central brain stem is more susceptible to anesthetic blockade than pauci-synaptic lateral pathways. (*Davis, H. S., and others: Anesthesiology 18: 634, 1957; Starzl, T. E., and others, J. Neurophysiol. 14: 479, 1951; French, J. D., and others: A. M. A. Arch. Neurol. & Psychiat. 69: 519, 1953*). [Project supported in part by the Atomic Energy Commission, AEC AT(30-1) 2277, contract with the George Washington University, Washington, D. C.]

Effect of Lidocaine on Different Portions of the Central Nervous System. BETTY J. BAMFORTH, M.D., JAMES R. KIMMEY, M.S., AND KARL L. SIEBECKER, JR., M.D. *Department of Anesthesiology, University Hospital, University of Wisconsin, Madison, Wisconsin.* Administration of lidocaine intravenously to patients deeply anesthetized with diethyl ether produces a decrease in alveolar ventilation, a four-minute period of apnea occurring in