

remained effective or increased in effectiveness following reserpine. Although methoxamine is theoretically an amine oxidase inhibitor, there is no direct report concerning this in the literature. In summary, epinephrine, norepinephrine, and phenylephrine are all effective in combating the hypotension which follows the injection of reserpine. This is also true of methoxamine. This may be clinically useful in treatment of hypotension appearing in patients under anesthesia who have been on reserpine therapy. Although the cause of the above hypotension is not definitely known, one possibility in the light of the effect of reserpine on epinephrine and norepinephrine might be stated thus: The response of the body to depression of blood pressure is dependent at least in part on the release of epinephrine and norepinephrine. In the patient who has received reserpine, the response to depression of blood pressure caused by anesthetic agents may be impossible because of the scarcity of these amines. If this is correct then one logical way to correct the hypotension would be to supply the necessary amount of the missing catechol amines or some appropriate substitute.

Electromyography of the Diaphragm. B. RAYMOND FINK, M.D., AND S. H. NGAI, M.D. *Department of Anesthesiology, Columbia University College of Physicians and Surgeons, and the Anesthesiology Service, The Presbyterian Hospital, New York, N. Y.* This investigation into the electrical activity of the diaphragm was planned on the premise of a definite relation between the integrated electromyogram and the tension of skeletal muscle (*J. Physiol.* 123: 214, 1954). The object was to explore the usefulness of the integrated electromyogram as a measure of adequacy of respiration. Decerebrate cats were subjected to rebreathing of oxygen, to inspiration against increased resistance, to partial myo-neural block and to graduated doses of intravenous pentobarbital. Airway pressure, air flow rate, tidal volume, and the integral of diaphragmatic electrical activity were recorded continuously with a cathode ray oscillograph. The integral activity rate was averaged over each period of inspiratory flow, and the average used as the index of diaphragmatic activity in each breath.

Activity was found throughout the diaphragm and when changes in the electrical activity rate occurred as a result of a respiratory stress, the changes were proportionately the same in all phases of an inspiration and in all parts of the muscle. When CO₂ was allowed to accumulate during rebreathing of oxygen, it was found that the rate of electrical activity was proportional to air flow rate and also to tidal volume. A similar linear relationship between electrical activity rate and tidal volume was found during the onset of and recovery from partial paralysis induced by succinylcholine. When the inspiratory flow resistance was increased, the electrical activity rate increased linearly with the added load. However, in this case, the duration of inspiration was always prolonged, whereas in rebreathing it was shortened. The effect of pentobarbital was to cause a prolonged inspiratory discharge, but at a decreased rate of activity. If the animal breathed spontaneously, the discharge rate recovered relatively rapidly over a period of five minutes, probably as a result of carbon dioxide accumulation. When carbon dioxide retention was prevented by means of artificial ventilation, a much slower recovery of activity took place. In the latter group of animals, the integrated electrical activity rate of the diaphragm proved remarkably sensitive to small doses of pentobarbital. Carbon dioxide retention, increased inspiratory resistance, muscle relaxants, and anesthetic drugs each produced a distinctive effect on the integrated electrical activity of the diaphragm. The clinical usefulness of these observations is being explored.

Prolonged Maintenance of Coronary Sinus Catheters in Dogs for the Study of Myocardial Metabolism. S. J. GALLA, M.D., A. W. R. WILLIAMSON, F.R.C.S., AND L. D. VANDAM, M.D. *Division of Anesthesia, Department of Surgery, Peter Bent Brigham Hospital and Harvard Medical School, Boston, Mass.* During investigation of the effects of anesthetic agents on the myocardial metabolism of dogs it was found necessary to develop a method of sampling blood from the coronary sinus in both the conscious and anesthetized states. Recent work (*Rudolph, A. M., and Paul, M. H.: J. Appl. Physiol.* 10:327, 1957) involving chronic catheterization of the pulmonary and