

during hemorrhagic shock in dogs did not produce a significantly greater survival rate (Bergentz, S. E., and Brief, D. K.: *Surgery* 58: 412, 1965). However, the present studies do show a definite circulatory deterioration with metabolic acidosis, and it would seem advisable to continue to correct the acidosis occurring during any circulatory crisis. *Conclusion:* These studies suggest the necessity for re-evaluation of current concepts of the role of pH in cardiovascular function.

A Comparison of Respiratory Effort of Infants Anesthetized with Several Adult and Pediatric Systems. JACKSON VER STEEG, M.D., and WENDELL C. STEVENS, M.D., *Department of Anesthesia, College of Medicine, University of Iowa, Iowa City, Iowa.* Recent work demonstrated that the acid-base balance and ventilation of infants anesthetized with an adult circle system compared favorably with infants anesthetized with pediatric apparatus. (Graff, and others: *Anesth. Analg.* 43: 583, 1964). No comparison of the effort required to maintain this normal balance was made. We questioned if these normal values with the adult circle system were maintained at a significant additional cost to the infant. Therefore, we compared the respiratory effort expended by infants using several adult and pediatric anesthetic circuits. *Method:* Infants under one year of age who had been anesthetized and intubated using halothane-nitrous oxide-oxygen or halothane-oxygen were studied following the surgical procedure. An infant pneumotachograph was interposed between the endotracheal tube and the system being studied. Airway pressure was monitored from an outlet of the pneumotachograph. A continuous record of breath-to-breath air flow-pressure relation was obtained via pressure transducers and Grass recorder. Inspiratory volumes were determined from the pneumotachogram by planimeter readings and application of appropriate calibration factors. Inspiratory negative pressure required to move the inspiratory volume was indicated by deflection of the recorder stylus from the line of zero airway pressure. The area enclosed by this deflection was determined by planimetric readings and was used as an indication of effort required by the infant to move that inspiratory volume.

An index of inspiratory effort was calculated by dividing the inspiratory volume (ml.) by the area of the inspiratory pressure trace (sq. mm.). Systems compared included a 6.2 mm. inside diameter T-piece with reservoir tube, two infant circle absorber systems, adult circle systems with various unidirectional valve components including McKesson, Dräger, Ohio and Foregger dome valves and Ohio swivel and Sierra-Y headpiece valves. *Results:* Except in one instance, the adult systems were less efficient than pediatric systems. The T-piece and infant circle systems were notably more efficient than the system incorporating the Sierra valve and somewhat more efficient than the system incorporating the Ohio-swivel valve. A comparison of adult system demonstrated definite differences among systems. The McKesson circle system was uniformly highly efficient and the Sierra-Y valve uniformly less efficient when compared to other circuits. The other circle-valve systems ranged between these two extremes. It was noted that the volumes of inspiration were not compromised by the less efficient systems. In nearly every case, the least efficient system maintained the largest inspiratory volume. *Discussion:* This method of comparison of systems was chosen because it provides a simple method of studying results of varying resistance to passage of gas offered by anesthetic equipment. It offers a means of depicting, for comparative purposes, the effort an infant must expend to inspire whatever volume of gas inspired and takes into account varying gas flow rates and varying resistances during the respiratory cycle. The inspiratory index, described here, gives some indication of the return the infant receives for the effort expended. Since the volumes of inspiration were not compromised by the less efficient systems, acid-base changes due to respiratory causes alone would not be expected.

Studies on Latency and Duration of Action of Succinylcholine Chloride. LEONARD WALTERS, M.D., *Department of Surgery/Anesthesiology, University of California, Los Angeles, School of Medicine, Los Angeles, California.* Previous studies of the duration of action of succinylcholine were based on the onset and duration of apnea. In the study reported