

where the operation was unexpectedly curtailed. . . .

"We have not found chest complications to be increased following this technique, but they have occurred in patients and operations where they might be expected. The incidence of postoperative vomiting is definitely diminished, and in our experience is mostly of minor degree. . . . In nine cases in this series, hiccup has arisen during the course of the operation. Hiccup is not necessarily associated with traction on the abdominal viscera. In one case it commenced during the closure of the peritoneum. It can frequently be stopped by a small dose of curare or pentothal. There were five deaths, all in 'poor risk' cases, within ten days of operation."

J. C. M. C.

PINSON, K. B.: *Mechanically Controlled Respiration in Thoracic Surgery. Anaesthesia.* 4: 79-87 (April) 1949.

"The Pulmonary Pump has now been in use for over 4 years, and valuable experience has been gained. The advantages of this method of conducting anaesthesia in chest surgery have become apparent. The apparatus consists essentially of two pumps, one of which takes over the respiration, while the other evacuates by suction secretion or pus from the trachea and bronchial tree. . . . The pump itself is provided with a method of adjusting stroke rate and volume, with large area release valves, and with a manometer. These devices have given no trouble and they effectively obviate the possibility of dangerous pressures, even if the patient should cough or resume active breathing efforts. . . .

"The average duration of operation was 3-6 hours, and of mechanically controlled respiration 1-9 hours. Pumping in all cases was continued

until the operation was finished. The great majority were 'dry' cases. In most cases there was complete apnoea with no movement of diaphragm; in others slight movement, and in two or three a resumption from time to time of some efforts of respiration. . . . Suction was employed in all cases, and general was constant for 'wet' cases, being applied to the affected bronchus, and on the unaffected side to the bronchus or the lower end of the trachea. In almost all cases it was possible to keep the colour good. Towards the end of long operations the quality of the pulse often deteriorated; and not infrequently after the bandages had been applied and the patient put back to bed his condition would appear considerably worse than it had been 10 minutes earlier. This may be partly explained by the absence of such circulatory aid as the pumping had given; but a full explanation is wanting. In no case was it necessary to continue pumping beyond the end of the operation."

J. C. M. C.

BROWN, HARRY: *Anesthesia in Trans-thoracic Surgery of the Alimentary Tract.* Arch. Surg. 58: 679-683 (May) 1949.

"The achievements of transthoracic surgery in a large measure have been made possible by the concurrent advances in anaesthesiology. . . . The choice of anesthetic agent or agents is secondary to the ability of the anesthetist to take care of the patient during operation. While it is possible with a tight face mask to maintain anaesthesia, intubation of the trachea is preferred. . . . The technic of anaesthesia usually is as follows: Prior to operation the surgeon discusses the general problems and the physical status of the patient with the anes-

thetist. The anesthetist visits the patient before the operation, appraises his physical status and questions him as to his activities with a view to determining the functional capacity of the heart or the limitations of respiratory function. The anesthetist checks the laboratory data, especially the red blood cell and the hemoglobin counts. The anesthetist writes the hospital orders for premedication. . . .

"When the patient arrives at the operating room, an intravenous drip of one-sixth molar sodium lactate is started and anesthesia is induced with pentothal sodium[®] and d-tubocurarine chloride solution.[®] During the induction period and while the effect of previously administered medicaments is being observed, the patient is given a mixture of 75 per cent nitrous oxide with 25 per cent oxygen. As the curare takes its effect and the respiratory exchange is decreased, the lungs are inflated by manual compression of the breathing bag. This constitutes compensated or assisted respiration given to avoid hypoxia. Thus, after a period of three to five minutes, the patient may be intubated under direct vision laryngoscopy. After this anesthesia is maintained with nitrous oxide and oxygen in a semiclosed system, with frequent manual assistance to respiration after the pleura is opened. Small amounts of pentothal sodium[®] may be given as indicated. The concentration of oxygen is increased as indicated. Demerol hydrochloride[®] may be used intravenously if it is apparent that excessive amounts of pentothal sodium[®] are required. Every twenty to thirty minutes the progress of the operation is interrupted for one to two minutes while the collapsed lung is expanded by the anesthetist. . . . Whenever mucus or other secretion accumulates, it is desirable to aspirate the trachea before inflating

the lung. In all cases a vein is cannulated with an 18 gage needle for administration of blood, crystalloid, pentothal sodium, procaine hydrochloride or curare. . . . The surgeon and the anesthetist must be on a constant watch for cardiac arrhythmia. In some reported cases it has seemed desirable as prophylaxis to inject into the autonomic nerves at the hilus of the lung 1 per cent procaine hydrochloride either before section of the vagi or immediately arrhythmia is noted. In some instances I have given as prophylaxis an intravenous drip of procaine hydrochloride, 0.1 to 0.5 per cent in dextrose, water or sodium chloride solution. . . . If arrhythmia occurs suddenly, one may give procaine hydrochloride, 50 to 100 mg., intravenously, as the most rapid means of administration. While it is not always necessary for the surgeon to discontinue operation, he should do so if it is indicated. . . . If cardiac stoppage occurs, the surgeon should immediately institute manual compression of the heart until spontaneous heart beat is resumed within thirty to sixty seconds. If heart beat is not resumed within this time, he should inject 1.0 cc. of epinephrine hydrochloride directly into the heart. . . .

"It hardly seems necessary to state that it is a part of the anesthetist's duty to keep constantly aware of what the surgeon is endeavoring to do. . . . When the pleura is being closed, the anesthetist inflates the lung. . . . At the conclusion of operation, the lung is expanded under direct vision. . . . The anesthetist's participation in the early postoperative care of the patient is as important as it is during operation. During this period the anesthetist is concerned chiefly with the prevention and treatment of atelectasis."

J. C. M. C.