mal outlet and prevents any backward movement of nitrous. The same situation obtains in figure 1B although the oxygen and cyclopropane flowmeters are interchanged. The situation is reversed and hypoxia prevented by the flowmeter arrangement illustrated in figure 1C or in 1D. By placing the oxygen flowmeter nearest the outlet a leak at another flowmeter results in loss of anesthetic gas rather than oxygen. Although this may not result in anesthesia at least it does not set the stage for a potential disaster.

To test the hypotheses proposed an anesthetic machine which possessed the fail-safe device advocated by Epstein et al. was used but it also had a small, almost unnoticeable chip at the top of the cyclopropane flowmeter. The chip had been made on replacement of the flowmeter after cleaning. The arrangement of flowmeters, collection and outlet was the same as in figure 1A. With flowmeters set at eight liters of nitrous oxide and two liters of oxygen (typical induction flow), the oxygen concentration in the combined mixture was 6–7 per cent. At a flow rate of 3½ liters of nitrous oxide and 1½ liters of oxygen the oxygen concentration in the combined mixture was 11–13 per cent (oxygen concentration measured with a Beckman-Pauling type meter—Model D). The combined gases in the latter mixture were then directed into a circle system connected to a rubber bag in place of a patient. When the rubber bag was “ventilated” by intermittently squeezing the reservoir bag, the oxygen concentration in the system fell essentially to zero.

It is suggested that the manufacture of any new anesthetic machine should incorporate both the fail-safe device designed by Epstein et al., and the protective flowmeter arrangement illustrated in figure 1C or 1D. The oxygen flowmeter should always be placed nearest to the outlet from the common collecting chamber.

Reference

GADGET

Multi-Purpose Syringe and Manometer Holder

W. Forest Powell, M.D.*

Dr. Powell has built a versatile holder for syringes and various types of manometers used during anesthesia.

It consists of a piece of wood twelve inches long, one and five-eights inches wide, and thirteen-sixteenths inches thick, and contains six holes to accommodate two 20, two 10 and two 5 cubic centimeter syringes. The diameters of the holes are such as to allow the syringe barrels, but not the flanges, to slide through.

Part of the middle inch of the board is cut out so that the remainder measures seven-eighths inch in transverse diameter. After sanding and rounding the edges, it serves as one attachment for a Fisher clamp holder to connect the apparatus to a conventional intravenous stand. A battery clamp can be secured to the top by means of a rubber band. This

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Holder, clamped to intravenous stand, ready for use.
is an excellent holder for a venous or intra-arterial pressure manometer.

A right-angle hook can be fitted into the one end. This is a convenient holder for an aneroid manometer and stethoscope. The whole assembly can be adjusted to the desired height. These devices have been in use for over five years. The simplicity of quick multiple drug administration and circulatory monitoring has been gratifying.

CASE REPORTS

Delayed Postanoxic Encephalopathy

Dr. Philip Toker *

The immediate neurological effects of cerebral anoxia are very well known. A form of encephalopathy that may follow, after complete clinical recovery from anoxia, has so far attracted little attention.

Dr. Philip Toker believes, in view of the scarcity of reports on the subject, the following case is of interest.

Report of Case

A 7 year old healthy, male child was admitted for repair of a small umbilical hernia. Atropine, 0.4 mg., was given as premedication. Induction of anesthesia was with 150 mg. thiopental sodium 2½ per cent followed by 20 mg. succinylcholine chloride. The lungs were inflated with oxygen and the trachea intubated without difficulty. Anesthesia was maintained with oxygen, nitrous oxide, and ether, using an absorber with an intentional leak. The anesthetic and operation which lasted approximately one-half hour were uneventful. Frequent palpation of the radial pulse and the color of the patient gave no cause for alarm. There was practically no shock attached to the operation, bleeding was minimal, and the blood was of good color. As the operation was almost finished, the normal pink color of the patient's face changed to extreme pallor, the radial and carotid pulses were absent and on auscultation of the chest, no heart beat was audible. The surgeon immediately opened the chest and found the heart in asystole. After the heart was massaged 3 or 4 times, it resumed a normal rhythm and a radial pulse of 80/min. returned and the systolic blood pressure was 116 mm. of mercury. An intravenous drip of 5 per cent glucose in water was started and 15 ml. of 50 per cent sucrose given intravenously and the patient was returned to the ward. When seen in the ward shortly after, he was still unconscious. It was then decided to cool the patient, and his rectal temperature was brought to and maintained at 35° C. On the third postoperative day the patient's condition had improved and cooling was discontinued. A short while after the temperature returned to normal the patient began to speak and answered questions rationally. He made continued progress—both physically and mentally, had many toys with which he occupied himself, ate his food, slept well, was happy, and considered to be out of danger and well on the way to recovery.

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