

come flaccid, intramuscular pressure falls, venous return diminishes, arterial pressure falls. This is the first, or circulatory, stage of shock. When circulation decreases to a volume-flow insufficient for minimal oxygen requirements, tissue asphyxia develops, capillary walls are damaged, and a leakage of serum from the capillaries sets in. This is the second, or asphyxial, stage of shock.

In hemorrhage, loss of hemoglobin causes asphyxia. Death in hemorrhage is due to a pathological process initiated by asphyxia. Decrease in carbon dioxide and bicarbonates, an "acardia," is probably concerned in pathological changes in "shock." If after the loss of blood has ceased, minute-volume of breathing gradually increases, death ensues; if minute-volume decreases, the animal survives.

The paper exhibits the advantages and the disadvantages of a prolonged and unremitting "point of view."

A bibliography of sixty-seven references is appended.

A. S.

TAYLOR, N. B., AND MOORHOUSE, MARGARET S.: *The Use of Isinglass as a Blood Substitute in Haemorrhage and Shock*. *Canad. M. A. J.* **49**: 251-262 (Oct.) 1943.

These authors find isinglass to be a safe and effective transfusion material. The supply is almost unlimited and it can be manufactured relatively cheaply on a large scale. The efficiency of a transfusion material depends upon the size and shape of its molecule, in relation to the "pores" of the capillary walls. The particle size is also influenced by conditions in vivo, namely the pH, temperature, electrolyte concentration, and the presence of other colloids and organic compounds. Collagen molecules have much greater length than breadth thus pass less freely from the circulation than do larger but globular molecules as the molecules of serum albumin.

The true criterion of the effectiveness of a blood substitute is the restoration of the blood volume and its maintenance to the time when fluid produced by natural processes can take its place. Isinglass disappears from the circulation at a fairly rapid rate but not, apparently, until it has been replaced by plasma protein. There is evidence that the injected protein isinglass is later utilized by the body in the manufacture of plasma protein. Immediate effects of isinglass injection are about the same as when blood is injected.

A series of experiments done illustrates the value of a solution of isinglass in treatment of shock caused by acute hemorrhage. In the case of shock caused by muscle damage, transfusion either with blood or with isinglass was found to be relatively impotent.

As now prepared, isinglass has mild pyrogenic action but is free from antigenic action. The livers and kidneys of animals which had received repeated injections of isinglass were found to be normal.

A.

HINGSON, R. A., AND EDWARDS, W. B.: *Continuous Caudal Analgesia: A Study of the First Ten Thousand Confinements thus Managed with the Report of the Authors' First Thousand Cases*. *J. A. M. A.* **123**: 538-546 (Oct. 30) 1943.

"In our series of 1,150 cases, 1,050 or 91.3 per cent, have been managed through labor and delivery without resorting to any other form of analgesia or anesthesia. . . . The special malleable needle technic with the closed apparatus has been used by us in 1,000 of our cases. . . . In our hands it has given increasing satisfaction with the minimum of complications. . . . We prefer a 1.5 per cent solution of metycaine in isotonic solution of sodium chloride or isotonic solution of three chlorides because of (1) the high analgesic eff-

ciency of the drug, (2) the reduced number of reactions that could be ascribed to the drug and (3) the rapid elimination of the drug with a quick recovery of nerve impulses and physiologic control after delivery. . . . From our experience and the accumulated experience of others we believe that the following postulates should be emphasized by all obstetricians who use . . . [continuous caudal analgesia:] 1. The incidence of operative obstetrics is increased. No physician should use continuous caudal analgesia unless he is well trained in the use of forceps. 2. The incidence of posterior positions is increased to about 8 per cent because of the relaxation of the levator muscles with the resultant failure of a large number of the fetuses to rotate spontaneously. 3. The incidence of transverse arrest in the midpelvis is slightly increased because of the failure of the patient to use her auxiliary expulsive forces. 4. In the hands of the experienced, to offset the first three disadvantages, all types of operative obstetrics are facilitated because of the relaxation of the cervix, lower uterine segment and perineum. This relaxed state is not achieved by any other form of general anesthesia. 5. No oxytocic drug should be given until after the termination of the third stage of labor, because the uterus in every instance after continuous caudal analgesia contracts firmly with the delivery of the baby. Hemorrhage during the third stage is therefore definitely minimized. Gentle constant pressure on the fundus of the uterus as the placenta separates will usually expel it within two to five minutes after delivery. When oxytocic drugs are given immediately after the birth of the baby, the incidence of trapped placentas is increased. 6. Continuous caudal analgesia should be started only after labor is definitely established and the patient is in need of relief from pain. . . . 7. The babies born under continuous caudal anal-

gesia are just as alert and wide awake at birth as those born to mothers who had no form of sedation or anesthesia. Many of them cry before their shoulders are born. Therefore every attempt should be made to shield the mouth and nose of these babies from aspirating fluid and mucus as the noses cross the perineum. 8. The incidence of fetal mortality and morbidity may be expected to decrease considerably, since there is apparently less birth shock to them by this than by any other method. 9. The entire course of labor is altered from the picture described in textbooks under other forms of management. The first stage of labor is definitely shortened, the third stage is shortened and simplified. However, the terminal part of the second stage of labor is greatly prolonged unless outlet forceps are used on complete dilatation of the cervix and descent of the presenting part to the perineal floor. 10. An understanding of the anatomy of the peridural space, the sacrum and the surrounding structures is essential. A thorough knowledge of the neurology of the pelvic viscera is a prerequisite. A familiarity with the pharmacology of the cocaine derivatives and substitutes used in this method is necessary. The proper interpretation of the physiology of labor is altered by continuous caudal analgesia must be studied diligently. 11. For success with continuous caudal analgesia, knowledge of the related principles of the basic sciences must be combined with a high degree of obstetric competence and a skilful application of this new technic in anesthesiology. 5 references.

J. C. M.

LORHAN, P. H.: *Continuous Caudal Anesthesia in Obstetrics*. J. Missouri M. A. 40: 346-348 (Nov.) 1942.

"At the present time continuous caudal anesthesia in the hands of the