

pulses through the use of local or spinal anesthesia. Indications for the use of local or spinal anesthesia in shock are based on other grounds." 10 references.

J. C. M. C.

FLINK, EDWARD B.: *The Distinction of Hemolytic and Nonhemolytic Transfusion Reactions*. J. Lab. & Clin. Med. 30: 371-373 (April) 1945.

"The importance of immediate determination of the presence or absence of abnormal amounts of hemoglobin in the plasma following febrile transfusion reactions is stressed. Unless hemoglobinemia and hemoglobinuria are looked for, it is impossible to distinguish hemolytic from simple febrile reactions on clinical grounds alone."

A. W. F.

STRUMIA, M. M.; CHORNOCK, F. W.; BLAKE, A. D., AND KARR, W. G.: *The Use of a "Modified Globin" from Human Erythrocytes as a Plasma Substitute*. Am. J. M. Sc. 209: 436-442 (April) 1945.

"Outline of Composition of Hemoglobin. The hemoglobin content of normal human blood varies, but it is usually 14 to 16 gm. per 100 cc. Hemoglobin is very soluble in water, and consists of 3 components: iron, porphyrin and a protein, globin. Globin constitutes about 96% of the total hemoglobin. . . .

"When hemoglobin is broken down in the body, the 3 components are apparently split from each other. The iron is retained by the body for the formation of new hemoglobin. Some or all of the porphyrin, which has been identified as protoporphyrin, is converted to bilirubin. It may be assumed that the fate of the globin is similar to that of any other native tissue protein. The 3 components of hemoglobin can be separated chemically with relative ease. Mild treatment of oxyhemoglobin with acid read-

ily cleaves the globin from the iron-porphyrin combination. Treating oxidized heme with a weak acid will give iron plus protoporphyrin. . . .

"Comments. The expression 'plasma substitute' used in this paper is not to be construed as meaning that globin solutions can replace plasma in all instances. At best, 'modified globin' solutions can be expected to replace plasma insofar as colloidal osmotic properties are concerned.

"It is estimated that every year nearly 1½ billion cc. of packed red cells may be made available from the preparation of plasma for the Armed Forces and for the civilian population. By a relatively simple process, this hemoglobin can be transformed into a 'modified globin' at a fraction of the cost of plasma production.

"From the amount of red cells mentioned above 375,000 kg. of globin can be prepared, with an osmotic power about twice as great as an equivalent amount of plasma proteins, that is, an osmotic equivalent of about 12½ million liters of citrated plasma. In other words, from a blood donation it is possible to obtain about 250 cc. of plasma (about 17 gm. of plasma proteins) and about 24 gm. of globin. This globin is equivalent in osmotic power to about 600 cc. of plasma. Thus from a single 500 cc. donation of blood it is possible to obtain the osmotic equivalent of about 4 donations.

"As yet, the properties of this modified globin have not been fully investigated. It has been ascertained that this material is: (1) safe; (2) capable of replacing lost blood volume in cases of severe secondary shock."

A. W. F.

BOYNTON, M. H., AND TAYLOR, E. S.: *Complications Arising in Donors in a Mass Blood Procurement Project*. Am. J. M. Sc. 209: 421-436 (April) 1945.

"The Blood Donor Service of the American Red Cross has been in operation since February, 1941. As of April 1, 1944, over 7,000,000 pints of blood have been collected from volunteer donors throughout the United States to be processed into dried plasma and serum albumin for the Armed Forces. . . .

"It has been the experience of the Blood Donor Service that the accidents and complications which may occur can be classified roughly into 4 groups: (1) those related to the mechanics of the venepuncture, and including those occurring during the examination and preparation of the donor; (2) those occurring as a general systemic reaction and including all consequences thereof; (3) those occurring as late, delayed, or prolonged reactions; (4) those occurring as coincidental or unrelated accidents, but approximating the time of the donation.

"Group 1. The complications and accidents under this heading, with the exception of hematomata, constitute the smallest group. . . .

"A small number of individuals have exhibited a local sensitivity to the resin in the adhesive dressing which is used in most of the Centers to cover the site of the venepuncture. . . .

"Group 2. In this group the majority of reactions that occur can be classed as 'faints' with a subheading of 'the consequences thereof.' Syncope in blood donors has been and probably always will be a major problem in any donor organization. . . . Various estimates have been made of this percentage. Poles and Boycott state that 2.8% of 10,000 donors showed 'true' syncope. A Report to the British Medical Research Council gives a figure of 5.5%, using the term 'faints' to include all donors in whom 'the symptoms and signs associated with fainting were sufficient to delay or alter the normal procedure.'

A study of 16,000 volunteer Red Cross donors in Atlanta, Ga., gave a total syncope rate of 4.2%, whereas in a survey of 40,000 consecutive donors in 4 other large Red Cross Centers, a figure of 8.9% was obtained as indicating the number of donors who had any immediate reaction following the donation. . . .

"The problem of syncope among blood donors is magnified by the accidents which may occur when syncope precedes or is accompanied by a fall. The accidents which have occurred during such circumstances are listed below:

- (a) Scalp and head lacerations (108)
- (b) Abrasions elsewhere (32)
- (c) Basal skull fracture (2)
- (d) Mandibular fracture (3)
- (e) Fracture of nose (5)
- (f) Fracture of malar bone (1)
- (g) Fracture of finger (2)
- (h) Fracture of clavicle (3)
- (i) Fracture of olecranon process (1)
- (j) Chipped teeth (18)
- (k) Sprained ankle (4)
- (l) Mild concussion (14).

"Of all the complications which may occur coincident with or following a blood donation, cardiovascular accidents are the most disturbing. . . .

"No deaths attributable to cardiovascular causes have occurred in any Donor Center or at any Mobile Unit Station. . . .

"Group 3. According to the card survey summarized in Table 4, approximately 4% of all individuals who donate blood experience some limitation of their activities during the week following the donation. . . .

"It has been the feeling of those closely connected with the medical aspects of the Service that the 4% of individuals noting prolonged lassitude following a donation consisted chiefly of those women who may not have regenerated their hemoglobin with normal rapidity. . . .

"It is of interest to note that the donation of 500 cc. of blood may have a variable effect on the menstrual cycle in women. There have been a few complaints of an excessive or prolonged period shortly following a donation; the majority of women who make any note of an irregularity report a delayed or scanty period. It has not been possible as yet to correlate this information with hemoglobin values existing at the time. . . .

"Anyone who has had wide experience in hospital or private practice is well aware of the forms which 'hysteria' may take, especially in individuals with hypochondriac tendencies. It might, therefore, be expected that in a project with such a high degree of emotional appeal, there might be many individuals who would attempt to attach a multitude of minor complaints to the fact that they had given a blood donation. Whether because of the high degree of self-selection automatically practiced by the donors or whether because of the cooperative impulse involved in donating blood, there have been few instances in which a justifiable reason has not existed for a donor's complaint."

A. W. F.

SCHNALL, M. D., AND HEFFERNAN, R. J.: *Intrasternal Infusions in Obstetrical Hemorrhage*. *Am. J. Surg.* 68: 44-48 (April) 1945.

"Precautions

"1. Strict asepsis should be maintained from the time the skin is prepared for procaine infiltration until after removal of the needle, when the site is again prepared with alcohol and iodine and a sterile dressing applied.

"2. Osteoclysis is contraindicated in cases with septicemia.

"3. One should guard against piercing the posterior sternal plate. The sternum in infants and children is

poorly developed and should not be used.

"4. If marrow cannot be aspirated, fluid must not be injected. The lower femur or tibia has been used satisfactorily and may then be used. In children only the latter sites should be selected.

"5. Not more than one puncture should be made in the manubrium unless twelve hours have elapsed. An unsuccessful puncture in the body of the sternum at one place may be repeated only at some distance from the first. Some of the fluid running through the second puncture may flow out of the first puncture if the pressure be great enough and the openings close together.

"6. Circulatory overloading is to be avoided as with intravenous administrations.

"7. Hypertonic and irritating solutions should not be used."

A. W. F.

FINN, W. F.: *Air Embolism in Obstetrics and Gynecology*. *Am. J. Surg.* 68: 100-102 (April) 1945.

"There are two types of embolism—the venous and the arterial. In the venous air embolism air enters the peripheral veins and flows by means of the vena cava to the right heart and thence to the pulmonary arteries. In arterial embolism the site of entry is the pulmonary vein whence the air passes from the left ventricle to the systemic circulation and the brain.

"There is no agreement as to the amount of air which constitutes a fatal dose. Rabbits will die after the rapid injection of 10 cc. of air into an ear vein. In 1937, Richardson, Coles and Hall, basing their inferences on experimental air embolisms produced in small animals, estimated that about 500 cc. of air would be required to kill a human being. Moreover, there