

intramedullary route. Citrated blood, plasma, 5 per cent glucose and saline solutions were given by this method. The sternum or clavicle is chosen as the site of injection in adults and the tibia or fibula in children. The average rate of infusion is from 0.4 to 9 cc. per minute. Strict asepsis is observed throughout.

This method has proved practicable in 16 out of 17 trials. There have been no local or constitutional reactions as evidenced by clinical or x-ray findings following any of the infusions.

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EDITORIAL: *Dried Plasma*. *Lancet* 1: 80-81 (Jan. 18) 1941.

"Plasma is available in large quantities at blood banks where the supernatant fluid is removed from over-age stored blood. This fluid has been widely used in the restoration of the blood volume in shocked patients, and in the larger banks where the turnover is rapid it is still one of the best stock solutions. Its disadvantages are the excessive potassium content, which may be important when large volumes are given, and the precipitation after about a fortnight's storage, of fibrin webs in what then becomes simply diluted serum. Serum has been said to be more liable, as Best and Solandt affirm, that there is a therapeutic or physiological difference between the two when used for transfusion. . . .

"Both serum and plasma are difficult to handle and transport compared with the dried products, which also require extremely careful preparation. . . . With concentrated solutions of plasma and serum we are on less certain ground and their theoretical possibilities, particularly in burn-shock and nephrosis, have yet to be conclusively confirmed in practice. . . . Concentrated serum or plasma is also highly viscous, often requiring to be given under pressure, and is capable of causing venous

thrombosis. It is clear, therefore, that concentrated solutions should be used with discretion, and not everyone is convinced that it is good practice to introduce a viscous fluid into the bloodstream of a shocked patient whose circulation may already be seriously embarrassed by haemoconcentration." 5 references.

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ELLIOTT, JOHN; TATUM, W. L., AND BUSBY, G. F.: *Blood Plasma*. Mil. Surgeon 88: 118-125 (Feb.) 1941.

"Transfusion of modified blood was successfully used in the first World War for treating shock and hemorrhage. The use of blood was limited, due to the lack of laboratory and operating room facilities. A substitute for whole blood that eliminates the necessity for special facilities, is now available in blood plasma. It is being successfully used in England. . . . In 1936 we suggested that erythrocytes in a blood transfusion played little part in the treatment of shock and that the benefit was derived from the plasma. . . . We have made an intense study to show that in the treatment of shock in humans, blood plasma is as effective as whole blood. In hemorrhage, if plasma is administered early, it is seldom necessary to transfuse whole blood. The therapeutic effectiveness of plasma in burns and in the hypoproteinemic state cannot be questioned. . . . Blood serum was used for most of the experimental work in animals. We have used human blood plasma exclusively for many reasons; namely, the greater yield, simplicity of preparation, freedom from reaction and because outdated blood from our blood bank is an important source of plasma. The larger yield of plasma and freedom from reaction were important factors in the decision for its use by the British Army and also approval of the American Human Serum Association.