nerve endings. In some agents this effect is made more pronounced by the presence of a local anesthetic. . . . General anesthesia is not usually necessary or even advisable. If sufficient analgesia is not produced by opiates, further sedation can be induced by one of the barbiturates given orally or by rectum. The patient may be too shocked to warrant general anesthesia, or there may be concomitant injuries which make this out of the question. This is especially true in war injuries where the majority of burns are accompanied by other, and sometimes even more serious trauma. In those occasional cases where general anesthesia is desired, intravenous pentothal or evipal are invaluable." 13 references.

J. C. M. C.


"The present study is an attempt to determine: (1) The incidence of hypoproteinemia associated with operations, and the relationship to various procedures; (2) the factors which influence changes in plasma proteins; (3) the relationship between liver disorders and hypoproteinemia; and (4) methods of preventing and treating hypoproteinemia. . . . It seems apparent that a single hemorrhage of less than 500 cc. can be quickly compensated for and cause little or no change in the concentration of plasma proteins. Operative shock, on the other hand, resulting as it does, in diminished circulating blood volume and usually in hemoconcentration does cause alterations in the plasma proteins. . . . It was observed that a definite relationship exists between the duration of anesthesia and changes in the proteins. . . . It might be better to compare the duration of operation rather than duration of anesthesia, to the incidence of protein decrease. In operations under one hour, from 50 to 60 per cent of patients showed a decrease in plasma proteins, while in, operations lasting over two hours, all cases showed significant falls. . . . Ether, chloroform and cyclopropane are definitely toxic to the liver in certain concentrations. Likewise, they cause diminution in blood volume, principally in the plasma constituent. Procaine, used for induction of spinal or local anesthesia, is excreted through the liver and may also have a deleterious result. The effect of these actions on the level of the plasma protein would seem, theoretically, to be detrimental, but as yet we have no definite clinical evidence. . . .

"A significant decline in the plasma protein level was demonstrated in a considerable number of patients following surgical procedures. In a non-selective group of 215 patients, this decline was observed in 148, or 68.9 per cent. Our studies further indicated that a postoperative decline in plasma proteins was more common after certain types of operations. In this group were included operations upon the stomach and intestines, the biliary tract, the spine and large joints, and upon toxic thyroid disorders. A combination of many factors influenced the extent and duration of the diminished protein concentration. Among the direct and immediate causes were blood loss, shock and anesthesia, while among the indirect causes were the nutritional status of the patient and extent of the protein reserves and the adequacy of liver function. The depreciation of plasma proteins as a result of blood loss and shock was usually of short duration and readily amenable to therapy, if it did not quickly and spontaneously return to normal. When the protein reserves were exhausted or liver function was disturbed, the duration of protein depletion was prolonged and frequently the response to treatment
was irregular. The presence of sub-normal hepatic function as demonstrated by the hippuric acid excretion test was a certain indicator that a post-operative protein decline would occur. Impairment of liver function was observed in 48 patients in this series, and a substantial diminution in the plasma protein concentration occurred in each case. Inasmuch as liver physiology is known to be disturbed frequently in certain surgical conditions of an extrahepatic nature, it is essential that liver function tests be performed routinely in these cases. Included in this category are patients with biliary disease, hyperthyroidism, severe gastrointestinal disease associated with malnutrition, severe anemia, and carcinoma. The results of these tests should act as a guide for therapy.

"The treatment of plasma protein depletion depends on the extent and duration, the amount of available protein reserves, and the adequacy of liver function. Since certain operations are known to be almost constantly associated with marked protein loss, the estimated loss should be replaced during the operation by blood or plasma transfusions. In patients with normal liver function and adequate protein reserves, this substitution will be the only treatment necessary and operation need not be delayed. If the protein reserves are thought to be exhausted postponement of the operation is indicated until the reserves can be restored. Dietary therapy is particularly valuable in these patients and should consist of a high protein diet which contains ample amounts of food with high contents of certain key amino-acids. If this diet cannot be administered amino-acids may be fed with satisfactory results. In the group of patients with liver damage... therapy should be directed to a restoration of normal hepatic function. It has been shown that the lipid content of the liver is an index of the ability of this organ to function adequately. A high lipid content is deleterious. Furthermore, there is evidence that proteins, and more particularly certain amino-acids such as methionine and cystine, have a great lipotropic effect; that is, they mobilize liver lipid and make it easily available for disposition. Therefore, in order to restore liver function to normal, ample amounts of selected proteins must be given along with sufficient carbohydrate to supply energy requirements. Plasma is a readily available and potent source of the necessary proteins and often proves efficacious when dietary therapy fails. A study of the cases included in this series reveals that a proper therapeutic regimen is often neglected, and patients are operated upon before they are adequately prepared. We feel, that with proper preparation in the preoperative period, the extensive decline in the plasma proteins which were exhibited by these cases could be prevented frequently. Routine determinations of liver function should be made on all patients about to undergo major surgical procedures, and when possible, operation should be delayed until restoration of adequate liver function is accomplished. Careful supervision of the diet and the more frequent use of plasma transfusions for their nutritional effect would enable most patients to avoid the threatened hypoproteinemia associated with the operations under discussion. Recently, by applying the therapy outlined above, we have been able to prevent, or greatly minimize, these declines in plasma protein concentration." 35 references.

J. C. M. C.


"In the interval between the first and second world wars, basal narcotics were introduced and their technique developed, while during the last three