

COLLER, FREDERICK A., M.D., AND DE WEESE, MARION S., M.D., Ann Arbor, Michigan: *Preoperative and Post-operative Care*. J. A. M. A. 141: (Nov. 5) 1949.

Both the extremely young and the extremely old tolerate major operative procedures well if adequately prepared and understandingly managed. The presence of chronic organic disease, except heart disease in the patient with severe hypertension, should not preclude necessary surgery provided its presence is known.

In the malnutrition of chronic illness the body suffers from a deficiency of all food elements. Plasma protein levels do not always reflect the true nutritional state of the patient, recent involuntary weight loss is the best clinical manifestation of a deficient diet.

The dangers of hypoproteinemia include a lag in wound healing and increased incidence of wound dehiscence, a predisposition to the development of decubitus ulcers and increased susceptibility to shock, delay in gastric emptying time and retarded intestinal motility. Increased susceptibility to infectious diseases develops because of deficient production of antibodies.

The nutritional preparation of the patient is best carried out by the oral route whenever possible. The protein and caloric components of the daily intake should be accurately determined and recorded. In the chronically ill person protein hydrolysate may be used advantageously to supplement normal diets.

In severe esophageal or pyloric stenosis feeding by gastrostomy has been disappointing, and by jejunostomy of limited usefulness due to severe diarrhea caused by formerly used milk formulas; the use of homogenized milk may help to overcome this difficulty. In the author's experience parenterally administered protein has

an extremely limited field of usefulness, but is helpful in preparation of patients who cannot take diets in other ways.

If protein supplies are limited hematopoiesis enjoys top priority and may draw on other tissues to meet its requirements. The rational preoperative program must include transfusion of whole blood first, and the adequate protein intake later.

Selective operative measures should never be undertaken until the existing anemia has been treated. It has been recognized that the chronically ill tolerate surgery better after multiple blood transfusions.

Certain vitamins are important in preparation for surgery. Ascorbic acid (vitamin C) is essential in the healing of wounds and as much as 1 Gm. daily should be supplied; thiamine hydrochloride 10 mg. daily riboflavin 2 mg. and nicotinic acid 50 mg. daily of the vitamin B complex, aid in the metabolism of carbohydrates and the use of parenteral dextrose demands these vitamins. Vitamin K, a precursor in the formation of prothrombin, is urgently required by patients with hepatic insufficiency or lesions of the gastrointestinal tract producing obstructive jaundice, diarrhea or persistent vomiting. The prothrombin concentrations of all patients with significant gastro-intestinal lesions should be determined preoperatively. Severe operative hemorrhage may result if prothrombin deficiency is not corrected. Antibodies in the gastro-intestinal tract can cause hypoprothrombinemia by inhibition of the bacteria which usually synthesise vitamin K therein; and again, patients receiving intestinal antiseptics should be given supplementary amounts of vitamin K.

Diagnosis of dehydration and electrolyte imbalance is made predominantly on the basis of the clinical

picture. It has been noted, however, that clinical signs of dehydration are not usually manifested until a fluid loss comparable to 6% of the body weight has been reached.

Treatment of dehydration consists in the administration of appropriate volumes of Ringers solution and/or 5% dextrose in water. Sodium chloride solution alone corrects the simple alkylolysis of pyloric stenosis. Treatment of acidosis may necessitate the use of solutions of sodium lactate as well or, in the presence of hepatic insufficiency, of sodium bicarbonate. Dosages must be judged by clinical response. The daily total volume and specific gravity of the urine best reflect the water needs. In the presence of normal renal function and adequate urinary output (1000-1500 cc.) the determination of urinary chlorides provides an index of further sodium chloride requirements. These chemical abnormalities require immediate correction before surgery.

In the face of intestinal obstruction no definitive operation should be carried out by election until decompression has been effected. In general pyloric obstructions and obstructions of the upper part of the small intestine are best managed by gastroduodenal suction. The Miller-Abbott tube has its best application in obstructions of the small intestine without vascular embarrassment. It does not provide adequate decompression for the obstructed colon; it is unnecessary in the unobstructed colon. To proceed with definitive resection of the colon in the face of obstruction is to invite disaster and operative decompression should first be performed. Parenterally administered fluids and antibiotics are of proved value and should be utilized in the management of intestinal obstruction. The authors have discontinued the use of saline cathartics and enemas in preparation

for surgery, colonic lesions included, these measures are unnecessary and often add to dehydration and electrolytic disturbance.

The authors stress the importance of preoperative discussion with the patient of his disease, the anesthetic, the operation and anticipated postoperative course. Every patient should be encouraged to continue his normal way of life to the time of the operation.

During the period of operation the replacement of blood simultaneously with its loss is of considerable importance. The blood should be replaced in accordance with the demands of each individual case on the basis of the estimated amount of loss for the particular operation and surgeon. Blood volume cannot be effectively raised preoperatively as prophylaxis against subsequent hemorrhage and is most effectively replaced at the time of its loss.

In the operative and immediate postoperative periods there is suppression of renal function. Excess amounts of sodium chloride and water given at this time promote the development of edema. Water is best supplied in a 5 per cent solution of dextrose, and volumes greater than 1000 cc. are seldom necessary. Sodium chloride solution should not be given.

Simple confinement to bed has been shown to induce a negative nitrogen balance and to have a deleterious effect on the appetite. Conversely, early ambulation has a distinct protein sparing action and reduces the severity and duration of postoperative asthenia. The vital capacity of the lungs returns to normal more rapidly and the tensile strength of wounds is not impaired. Clinically the incidence of postoperative complications, especially pulmonary, is reduced after early rising and both the physical and the emotional convalescence are appreciably shortened. Patients are urged to

get out of bed within 24 hours of operation and are aided in walking about the room. They are made to walk at least twice a day after that and are permitted complete freedom of ambulation as soon as it is tolerated. The only real contraindications to early ambulation are severe illness and confining apparatus.

Water and electrolyte requirements in the immediate postoperative period are minimal. Renal function is usually extremely depressed during the first 12 to 48 hours after a serious operation; the selective excretion of electrolytes is temporarily disturbed and sodium chloride and water are retained within the extracellular spaces. During this period low urinary output is the rule, the extent of oliguria being in direct proportion to the severity of the operation and not related to the volume of fluid administered. Administration of sodium chloride at this time is unnecessary and only places a harmful burden on the depressed kidneys. On the day of operation intravenous fluids should be limited to blood in sufficient quantity to replace that lost and a volume of 5 per cent dextrose in water sufficient quantity to replace insensible water loss (approximately 1500 cc.).

Fluid and electrolyte requirements during the remainder of the convalescence are dependent on the patient's progress and are determined only after careful clinical appraisal. In general sufficient water should be administered to replace the insensible loss and support renal function. In the presence of normal renal function the specific gravity of the urine is the best index of water need, 2000 cc. daily will usually supply basal metabolic requirements. The oral route should be used as early as possible but if intravenous fluids are required 5 per cent dextrose in water is the solution of choice.

The need for blood may be antici-

pated in severe sepsis, intestinal obstruction and secondary hemorrhage or when large weeping wounds are present.

The authors believe that the important goal in postoperative nutrition is the return of the patient to the oral intake of whole natural foods as rapidly as possible not withstanding any kind of major gastrointestinal surgery. The only contraindication to solid food by mouth is the inability of the patient to retain them because of vomiting, paralytic ileus or intestinal obstruction. The use of protein hydrolysates or amino acids is reserved for the exceptional patient who is deprived of the oral or gastrojejunal route for a prolonged period. There is no evidence that the administration of essential amino acids in the immediate postoperative period will prevent protein catabolism. A patient never dies as a result of a few days negative nitrogen balance, which is fortunate because there seems to be no way of obviating this condition after severe trauma.

Carbohydrates are necessary and it is impossible to supply sufficient by the intravenous route without seriously overhydrating the patient. The caloric requirements must be met as rapidly as possible by oral feedings of carbohydrate and fat. Vitamin requirements during this period are the same as for the preoperative period.

The authors deprecate the routine use of constant gastro-duodenal suction except after gastric operations. It should be used intermittently for the use of vomiting or distention. The use and abuse of other postoperative measures is considered including the Miller-Abbott tube, cathartics and enemas, and sedatives.

Enforced cough and hyperventilation, intermittent tracheal suction and bronchoscopy if necessary are effective in preventing pulmonary atelectasis

and its consequent complications. The routine use of antibiotics as a substitute for these measures ignores the pathology of chest complications. Atelectasis should be suspected if there is a sharp rise of temperature in the first 48 hours, the diagnosis is made on physical signs and the treatment is clearance of and maintenance of a clear bronchial tree.

Thromboembolism and thrombophlebitis are discussed. Finally in the treatment of renal insufficiency stress is laid on the abuses that may be made in laid on the abuses that may be made of fluid therapy. In anuria and oliguria fluid is retained and excess will ultimately kill the patient. Thirty-three References.

D. K. K.