BLOOD CLOTTING PROBLEMS Clotting defects in the operating room can be treated with fresh frozen plasma for plasma coagulation factor deficiencies, platelet concentrates for platelet deficiencies and epsilon-aminocaproic acid (EACA) for fibrinolysis. Factors V and VIII are lacking in bank blood, so during massive blood replacement, 500 ml of fresh frozen plasma are given after every ten units of transfused bank blood. Vitamin K-dependent factor deficiencies should be treated with fresh frozen plasma, since intravenous vitamin K is not effective within four hours of its administration. Fresh whole blood is a poor substitute for platelet concentrate, as few platelets are added when the dilutional factor is considered. All platelet deficiencies benefit from platelet transfusion except idiopathic thrombocytopenic purpura, in which the patient's immune system rapidly destroys all platelets. The thrombelastograph, using whole blood instead of citrated plasma, has been helpful for simple rapid diagnosis of clotting disorders. (*Ryan, G. M., Boyan, C. P., and Howland, W. S.: Clotting Problems During Surgery, Surg. Clin. N. Amer. 49: 233 (April) 1969.*)

FLUID REPLACEMENT Blood volume and extracellular fluid volume were measured with ^{51}Cr and ^{35}S, respectively, in eight patients, 16 hours before and six hours after major abdominal surgery. After surgery, the erythrocyte volume decreased by 3.4 per cent and the plasma volume by 15.9 per cent. The interstitial fluid volume increased by 22.8 per cent and the extracellular fluid volume (ECF) decreased by 15.5 per cent. The average volume of electrolyte solution infused during operation and until postoperative blood samples were withdrawn was approximately 50 ml/kg body weight. The increase in ECF volume was due to infusion of fluid during surgery and in the early postoperative period. Considering the amount of fluid given and the volume of urine excreted, there was no significant change in ECF volume compared with the preoperative value. In other words, the operative trauma was not associated with a decrease of ECF volume. These findings are in contrast to the results of other investigators who have reported deficits in ECF volume of up to 28 per cent, or 4,500 ml. The difference is probably the result of methodological errors in previous studies. Mixing of ^{35}S in the ECF space is not complete until 75 to 120 minutes after injection. Measurement of ECF volume 20 minutes after injection of the radioisotope, as was done in previous studies, will result in inaccurate values. None of the patients studied showed any signs of pulmonary edema or other undesirable sequelae of overhydration. A healthy surgical patient can tolerate large amounts of infused crystalloids, but this may be hazardous in patients with overt or latent cardiac or renal failure. There is no need for massive infusions of crystalloid solutions following extensive general surgery in view of the absence of a real deficit in the extracellular fluid space. (*Roth, E., Lax, L. C., and Maloney, J. V., Jr.: Operative Trauma and Extracellular Fluid Volume, Langenbeck Arch. Klin. Chir. 323: 154 (Dec.) 1968.*)

METABOLISM AND ANESTHESIA Acid–base balance and several indices of anaerobic and aerobic carbohydrate metabolism were studied in 332 patients subjected to anesthesia and major surgical operations. Arterial blood samples were obtained immediately prior to operation, at intervals during operation, and at the end of surgery. Samples were analyzed for hematocrit, acid–base balance, glucose, lactate, pyruvate, and excess lactate in all patients. In addition, citrate, ketoglutarate, malate, inorganic phosphate, ATP, ADP, and AMP levels were determined in some patients. The major causes of elevated lactate levels were cellular hypoxia subsequent to inadequate perfusion, massive blood replacement, or ether anesthesia. The only major differences in patients receiving ether, halothane or thiopental occurred in the levels of total and excess lactate and pyruvate. Ether produced significantly greater amounts of total and excess lactate. The lactate increases with the other two agents were due almost entirely to excess lactate production. (*Schweizer, O., and Howland, W. S.: Some Metabolic Changes Associated with Anesthesia and Operation, Surg. Clin. N. Amer. 49: 223 (April) 1969.*)