study could be enhanced, however, if the authors would provide us with clarification on a few points:

1. Were topical wound therapy, surgery, percentage of third degree burn, and incidence of nonthermal injury and nonpulmonary infection equivalent in the two treatment groups during the period of study?
2. Do the authors agree that their conclusions do not apply to patient types not studied? Specifically, I believe they have not demonstrated the improved cardiac output achieved by colloid resuscitation in the first 24 hours to be unimportant for the elderly, those with compromised cardiac function, delayed resuscitation, etc.
3. The most important problem to be addressed, however, is the apparently *a priori* policy whereby "plasma volume was replaced on the second postburn day by giving colloid equivalent to plasma in a dosage of 0.3–0.5 ml/kg body weight/% body surface burn." This colloid infusion (approximately equivalent to that recommended during the first postburn day in the original Brooke formula) was apparently given to both treatment groups, even when colloid given on the first postburn day could be anticipated, and was subsequently shown ". . . to be associated with earlier intravascular volume restitution . . . during the later half of the first postburn day. . . ." Rote administration of this volume of colloid on the second postburn day without consideration of cardiac output, hematocrit, measured plasma volume, or similar parameters may have systematically volume-overloaded the colloid-treatment group. If such occurred, greater problems with pulmonary edema would not be surprising during the fifth and/or seventh postburn days.

BRUCE E. ZAWACKI, M.D.
Los Angeles, California

February 28, 1984

Dear Editor:

Dr. Zawacki has asked three very pertinent questions pertaining to the experimental design of our prospective randomized study of resuscitation fluid composition. All phases of this investigation were conducted under a very rigid clinical protocol. Topical chemotherapy in all patients consisted of the use of mafenide acetate during the 12 daylight hours and silver sulfadiazine during the 12 nighttime hours. The percentage of third degree burn was identical in both groups, 15.7% of body surface in the crystalloid group and 15% in the colloid group. Patients who had other forms of injury were excluded from the study. During the 7-day period of the study, no elective surgical procedure was carried out and the number of invasive diagnostic procedures (bronchoscopy) was identical in both groups. Wound cultures in each group showed the typical progression of surface colonization, but no patients in either group developed confirmed positive blood cultures during the first postburn week.

The study was designed to study previously healthy young patients in order to eliminate the interaction effect of pre-existing diseases that might compromise resuscitation. Therefore, it is impossible to extrapolate directly these data to the elderly, to those with compromise cardiac function, and to other categories of patients outlined by Dr. Zawacki. However, we have no indication that our criteria for resuscitation adequacy would not apply to these categories of patients. Specifically, if vascular pressures and urinary output reflect adequate fluid replacement in any burned patient, we would not add additional fluid volume to elevate the moderately decreased cardiac output typically seen early in the resuscitation phase.[1] We feel that such a practice accentuates the accumulation of edema in injured tissues.

Both groups received fluid and plasma volume replacement according to the modified Brooke formula.[1] This approach dictates the administration of plasma equivalent fluid in a dosage of 0.3–0.5 ml/kg body weight/per cent body surface burn on the second postburn day. In addition to this fluid regimen, the colloid treatment group received 25 grams of albumin in each liter of lactated Ringer's solution during the initial 24 postburn hours. No other changes in the modified Brooke formula were permitted so that the sole effect of this single intervention could be assessed. Within the bounds of adequate patient safety, sound experimental design may require "rote administration." Since colloid administration on the second postburn day accounts for only a small portion of that day's total fluid administration, volume overload did not appear to have occurred as indicated by clinical examination, measurement of pulmonary artery wedge pressures, and serial changes in body weight. These findings confirm the clinical impression that the lungs are most susceptible to the development of edema during the fourth through seventh days, when edema fluid is being mobilized from injured tissues to the central circulation.

I appreciate Dr. Zawacki's observations. His concerns and the findings of this study would indicate that a trial investigating the omission of colloid altogether may be in order.

CLEON W. GOODWIN, M.D.
New York, New York

Reference

1. Pruitt BA, Jr. Advances in fluid therapy and the early care of the burned patient. World J Surg 1978; 2:139.

February 10, 1984

Dear Editor:

As described by Drs. Schorlemmer and Battaglini in their recent paper, "An Unusual Complication of Naso-Enteral Feeding with Small-Diameter Feeding Tubes" (Ann Surg 1984; 199:104–06), the rigid guide wire used in small-diameter feeding tubes appears to increase the probability of nasotracheal intubation. Although there are reportedly no previous reports of this problem using the small-diameter feeding tube, I suspect that this problem is more frequent than reported, especially in patients with altered tracheobronchial sensation. Over a 4-month period, this problem was documented in two patients in our institution. One patient, a 52-year-old man undergoing treatment for meningitis, was placed on enteral hyperalimentation after a small-diameter feeding tube had been inserted and checked for placement by auscultation over the left upper quadrant. Severe respiratory distress and hypoxemia followed. Chest x-ray revealed a hydropneumothorax. Although the patient was initially managed by tube thoracostomy, his clinical course was complicated by pneumonitis, bronchopleural fistula, and empyema. He eventually succumbed to bilateral bronchopneumonia.

The second patient, an elderly woman with congestive heart failure, was noted to have her feeding tube in her right pleural space on inspection of the chest x-ray that was taken after the feeding tube was inserted. Since the experience with the first patient, mandatory roentgenographic verification of catheter location prior to initiating tube feeding has been emphasized.

As stated by Drs. Schorlemmer and Battaglini, patients with diminished tracheobronchial sensation are a high risk group for nasotracheal intubation using small-diameter feeding tubes. These tubes should be inserted by or under the direct supervision of experienced personnel who are attuned to this problem. More importantly, the wire introducer should not be advanced beyond the nasopharynx, and x-ray verification of catheter location should be mandatory.

J. STONEWALL DORSEY, M.D.
Saint Paul, Minnesota

March 9, 1984

Dear Editor:

We appreciate Dr. Dorsey's letter and agree with him that this complication is probably more frequent than one would suspect. In fact, we have received quite a large number of requests for reprints and several of these were accompanied by letters describing patients with similar problems caused by small-diameter feeding tubes. We agree completely with his recommendation that these small-diameter feeding tubes be inserted cautiously and with appropriate supervision. Verification of the location of the catheter by x-ray examination is indeed mandatory and, if strictly adhered to, should reduce the complication rate.

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