

## CORRESPONDENCE

Anesthesiology  
79:189, 1993  
© 1993 American Society of Anesthesiologists, Inc.  
J. B. Lippincott Company, Philadelphia

*In Reply:*—I appreciate the comments on our study<sup>1</sup> offered by Ruta and Mutch. However, I disagree with some of their statements. First, our study was unique in comparing the effects on organ blood flows of hemorrhage superimposed upon three techniques of deliberate hypotension. The study was designed to demonstrate the effects of hemorrhage, not the effects of hemorrhage combined with other drugs or resuscitation techniques. In contrast, their study, demonstrated the effects of resuscitation following hemorrhage during deliberate hypotension with isoflurane only.<sup>2</sup> Additionally, only regional cerebral blood flow and renal blood flow were reported in their study.

Second, I believe that their study demonstrates one reason for our study design: resuscitation may influence different vascular beds in a heterogeneous manner. For example, despite their criticism of our work that brain and kidney blood flow could be restored to prehemorrhagic values by their different resuscitation methods, examination of their paper shows that blood flow was restored to brain structures in a differential manner and that renal blood flow was not restored at all!

Third, they rightly point out that our animals hemorrhaged during isoflurane hypotension had a significantly greater pH value compared with our other hemorrhaged animals. From this, Ruta and Mutch would conclude that hemorrhage during hypotension with deep isoflurane is associated with the least metabolic compromise of the three techniques. We did not measure any specific metabolic param-

eters and so cannot comment this possibility. However, I wonder whether they would apply the same inference to their own data in which the pH decreased in each group following resuscitation?

Though Ruta and Mutch are correct to imply that the direct extrapolation of our data to the clinical situation should be done thoughtfully, the same can be said of most, if not all research.

**Richard J. Sperry, M.D.**  
Department of Anesthesiology  
The University of Utah  
50 North Medical Drive  
Salt Lake City, Utah 84132

## References

1. Sperry RJ, Monk CR, Durieux ME, Longnecker DE: The influence of hemorrhage on organ perfusion during deliberate hypotension. *ANESTHESIOLOGY* 77:1171-1177, 1992
2. Ruta TS, Mutch WAC: Regional cerebral blood flow following hemorrhage during isoflurane anesthesia in the rabbit: Comparison of techniques to support blood pressure. *ANESTHESIOLOGY* 70:978-983, 1989

(Accepted for publication March 28, 1993.)

Anesthesiology  
79:189-190, 1993  
© 1993 American Society of Anesthesiologists, Inc.  
J. B. Lippincott Company, Philadelphia

## Spinal Anesthesia for a Former Premature Infant Undergoing Upper Abdominal Surgery

*To the Editor:*—Spinal anesthesia for former premature infants with significant residual pulmonary pathology has been recommended for surgery below the diaphragm, particularly lower extremity (e.g., club foot repair) or lower abdominal (e.g., herniorrhaphy or orchiopepy) operations. We report a case of upper abdominal surgery performed safely with a spinal anesthetic.

The patient is a 14-month-old boy requiring gastrostomy placement and bilateral inguinal hernia repair. His medical history is significant for a preterm delivery at 28 weeks' gestational age with a birth weight of 1,060 g. His neonatal course was complicated by severe infant respiratory distress syndrome requiring prolonged intubation and intermittent jet ventilation and air leaks requiring chest tube placement. He also had multiple bouts of sepsis, thrombocytopenia, multiple transfusions, chylothorax, jaundice, intraventricular hemorrhage, and perforated necrotizing enterocolitis.

At the time of this operation, he had no acute infectious problems, was developmentally delayed, required 0.5 L nasal cannula oxygen

support, and weighed 3.48 kg. His medications included Hydrodiuril, spironolactone, phenobarbital, Cholestyramine, Kaopectate, terbutaline, prednisone, and theophylline. He had no allergies.

His physical examination revealed an undernourished, relatively macrocephalic boy. He had a normal airway, good air entry bilaterally without adventitious sounds, and a regular heart rate without murmurs. His hematocrit was 32%, and his electrolytes were normal.

He was brought to the operating room, where he was monitored with electrocardiogram, automated blood pressure cuff, pulse oximeter, precordial stethoscope, and end-tidal carbon dioxide. He was positioned in the right lateral decubitus, and a 22-G, 2-inch Quincke point spinal needle was inserted into the subarachnoid space *via* the L4-L5 interspace. Four milligrams hyperbaric tetracaine with an epinephrine wash was injected. The needle and syringe were left in place for 5 s prior to removal, to avoid leakage of medication into the needle tract.<sup>1</sup>

The electrocautery ground was placed while the child was on his