Although available for decades, spinal anesthesia was not extensively used in infants since the mid-1970s (1). Williams et al. (2) (using the Vermont Infant Spinal Registry) have been prospectively collecting data on spinal anesthesia in infants performed over the last 25 years. In this issue of Anesthesia & Analgesia, their group has collated these data and presented the readers with a fascinating profile, although some of these data have been previously published (3). This report of 1554 spinal anesthetics performed over a period of 25 years equates roughly to about 60 spinal anesthetics a year. This is a small number compared with the number of spinal anesthetics performed regularly in adult patients but is still impressive for infants receiving spinal anesthesia. Why are we not performing as many spinal anesthetics in other institutions in the United States and abroad?

The use of general anesthesia is certainly more prevalent in neonates and infants in most institutions. Several advances in pediatric anesthesia contribute to this, including (a) the use of pulse oximetry; (b) reliable, intermediate-acting nondepolarizing drugs; (c) volatile anesthetics with a high coefficient of solubility that can offer an “on/off” phenomenon; (d) the use of the laryngeal mask airway; and (e) the decrease in prolonged ventilation in premature infants with the advent of surfactant, which has decreased chronic lung disease. The safety concerns involved in securing an infant’s airway are far less today than about two decades ago. Then why bother using a spinal anesthetic in infants? There may be some advantage in premature infants prone to apnea and bradycardia (4), but the incidence of apnea and bradycardia is only decreased if spinal anesthesia is performed without the use of any additional sedatives.

There is no discussion of selection criteria of suitable patients in this review, nor is there any way to use these data to make meaningful comparisons between spinal and general anesthesia efficacy and safety. However, the study offers some insight into the success rate in performance of the blocks by residents versus attending anesthesiologists dedicated to the technique. The success rate for anesthesia residents performing a lumbar puncture (LP) was only 83%, in sharp contrast to attending anesthesiologists who successfully performed LP 98.9% of the time. Are most residencies teaching our residents to perform LPs in infants? The average pediatric resident in training performs about 20 LPs during his or her training while neonatologists perform LPs on an everyday basis. Of more direct interest, the 2003–2004 logs of anesthesia trainees in Accreditation Council for Graduate Medical Education-approved pediatric anesthesia fellowships showed an average of 2.5 spinal anesthetics during their entire training, with the 90th percentile being 5 blocks in a year (M. A. Rockoff and S. C. Hall, personal communication, 2005). Can we expect residents or fellows to become adequately proficient in a technique with few attempts? For that matter, how many blocks does it take for an attending physician to remain proficient in this technically challenging technique?

Although a Bromage score was not recorded to determine adequacy of block in this study, success was based on surgical anesthesia for the scheduled case. This leads one to wonder about the significance of their reporting the use of additional sedation in 25% of the cases. Does this use of sedation indicate that the technique was inadequate, not long-lasting enough or related to other issues? We are also intrigued by the use of spinal anesthesia for procedures including exploratory laparotomy, meningomyelocele, and patent ductus arteriosus repair. Could combined epidural/general anesthesia offer an advantage? The duration of surgical anesthesia and analgesia is limited with spinal anesthesia in infants. Would a combined general anesthetic with a caudal/epidural blockade offer longer surgical anesthesia, along with postoperative analgesia, especially for longer cases?
In our institution, we have used a combined spinal/caudal anesthesia for premature infants presenting for hernia repair, especially when the procedure is expected to last longer than would reasonably be covered by a single-shot bupivacaine spinal. The dosage of local anesthetic can still be maintained below toxic levels, and the length of surgical analgesia is prolonged. Should another option be explored, including the use of 2-chlorprocaine by infusion or multiple intermittent dosing in these infants? A well-done study by Henderson et al. (5) safely used 2-chlorprocaine for surgical anesthesia in infants. 2-chlorprocaine provides profound motor block of short duration, hence the need for continuous infusions or at least intermittent injections.

The question of whether a spinal anesthetic will be appropriate and the best choice for infants can only be answered if we teach our fellow anesthesiologists to perform more of these during their training. Only by comparing complications and success rates of anesthesiologists comfortable in the use of both regional and general anesthetic techniques can we gain insight about the safety and appropriateness of both techniques. The Williams et al. study (2) demonstrates the success in performing spinal anesthetics with practice and a group dedicated to the use of this technique. What is needed now is a comparison with alternative techniques to help guide us all into what is not only possible, but best, for infants and children.

References