In Reply — Although I fully agree with the slogan that prevention is better than intervention (and that message is well embraced by the FIO2 parameter in the desaturation model in my article), the slogan for my conclusion "if V₄ is thought to be 0, or near 0," is that it is better to be safe than sorry. One must remember that my analysis probably underestimated the danger of severe hypoxemia by assuming complete alveolar denitrogenation (rarely achieved) and by ignoring the fact that concomitantly administered anesthetics may delay functional recovery (frequently true), result in loss of airway patency (often true), and adversely change physiologic variables (e.g., decrease functional residual capacity and cardiac output). In addition, and very importantly, I presented mean data, which means that for half of the population the danger will be greater and for half of the population the danger will be less. In the final analysis every practitioner has to ask themselves, given the boundary conditions in my article, after 1 min, if they would be willing to simply wait for succinylcholine to wear off if there is no ventilation and no obvious likelihood there will be ventilation. A negative answer seems obvious. I would not want to try and justify injury to the patient on the basis of the myriad of arguments for increasing the margin of safety of 1 mg/kg succinylcholine brought forward by Dr. Bourke; the arguments are either not substantial (e.g., minor discrepancies in succinylcholine dosing used in the literature), agreed on (decreasing the succinylcholine dosage shortens the duration of apnea), unrealistic (use 0.20–0.25 mg/kg of succinylcholine), or potentially dangerous (some patients might survive breathing spontaneously [diaphragmatic movement does not necessarily equate with respiration] with a single twitch height that is only 50% of control).

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Safety of Patient-controlled Intravenous Meperidine

To the Editor — We would like to congratulate Sharma et al.1 on the results of their study examining the relationship between cesarean section and epidural analgesia during labor in which they address the problem of "labor pain selection bias." This current study addressed many of the concerns that were raised with their previous study.2

We would like to express concern, however, regarding their conclusion that "we found meperidine PCA to be a safe and effective method of pain relief."1 On what basis was this conclusion made? When the two groups were compared in terms of maternal satisfaction, pain scores in the first and second stages of labor, maternal desire for the same form of analgesia, and maternal sedation, the epidural group was significantly superior on all accounts. Perhaps they believed that there was a smaller crossover from the PCA group to the epidural group, in contrast to their previous study, this suggested that the PCA group had effective analgesia. Because the thrust of this study by caregivers and investigators was to keep patients in their original group, this may also have contributed to the sense that adequate analgesia was provided. The statistically significant difference between the two groups in respect to maternal satisfaction and desire for the same form of analgesia again cannot be ignored.

On the issue of safety, Chestnut in his accompanying editorial makes the following comment, "Maternal administration of high doses of opioids may result in substantial neonatal effects (e.g., respiratory depression, prolonged neurobehavioral changes). These factors have been largely ignored in this debate."3 Neonatal safety in this study was examined using Apgar scores, umbilical artery gases, naloxone requirements, and intensive care admission. There was a statistically significant difference between the groups in the use of naloxone. Differences for the other parameters of neonatal outcome failed to reach statistical significance, although there is no evidence presented that this study had the power to examine this question, and it would be wrong to draw firm conclusions. It would have been valuable if the authors had examined neonatal neurobehavioral changes in the two groups. There is a large body of evidence that meperidine used for labor analgesia causes significant neurobehavioral effects.45 Many of these studies involved lower doses than those used in this study. The clinical significance of these more subtle changes in neonatal behavior are not clearly defined, but when considering neonatal safety, these effects should not be ignored.

In conclusion, we agree with the authors that "labor epidural analgesia in women at full term with uncomplicated pregnancies and in spontaneous active labor is not associated with increased numbers of cesarean delivery."4 However, until there is further evidence as to the safety of PCA meperidine, particularly on the neonate, we do not think it should be considered a safe and effective method of pain relief during labor.

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PCA—Not As Effective but Still a Valuable Method

To the Editor—The main purpose of Sharma et al’s trial was to establish the effect of epidural analgesia on the rate of cesarean deliveries. It compared epidural with patient-controlled analgesia (PCA) with intravenous meperidine. That technique has never been widely used in obstetrics, but their trial has established again that it is not as effective as epidural analgesia, but it is still a valuable method.

My experience with a Welsh population of mixed social and economic status (there is no private obstetric practice in Cardiff in contrast to poor, Hispanic, or black patients pointed out by Chestnut as a restriction in Sharma’s trial) is similar, even though the equipment, dosage, and lockout times differed. Mean (± SD) meperidine doses were 139 mg (100 mg) for Sharma et al and 171 mg (74.9) for multiparous women and 158.9 mg (74.2) for multiparous women in our trial. In this study with PCA, nearly 65% reported good to excellent pain relief, and 70% would use the method again. In our study women receiving epidural anesthesia had linear analogue scores of 88.5% with epidural block compared with 67.2% with intramuscular meperidine. PCA and intramuscular analgesia in Cardiff had similar scores. About two thirds of women would choose the same method, epidural or meperidine, again.

Chestnut is concerned about the neonatal effects of high-dose opioids, which were not discussed in this report. These have been studied previously. It has been shown that naloxone, 40 μg, can reverse the respiratory effects for a time, and intramuscular naloxone, 200 μg, will reverse ventilatory, auditory, and feeding effects for at least 48 h after birth. The babies of women who had intramuscular naloxone and meperidine had significantly fewer effects, especially on muscle tone than those whose mothers received epidural block with bupivacaine (Mean ± SD, 130 ± 61.7 mg).

There can be no doubt that epidural block is the most effective form of pain relief in labor. Although there are risks associated with this method, it is largely safe administered under skilled obstetric anesthesiologist care. Nevertheless, Sharma et al have demonstrated clearly again that PCA meperidine is an reasonable option in some circumstances, acceptable to mothers in the United States and in the United Kingdom. It can be made safe for the neonate.

Sharma et al believe that this useful alternative does not require the involvement of an anesthesiologist. I dispute that. Like postoperative pain relief, only an team led by an anesthesiologist is likely to introduce and maintain interest in effective techniques in the labor and delivery areas.

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References