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In Reply:—We thank the editor for the opportunity to respond to the letter by Hartung, who has commented on the association between postoperative nausea and vomiting. For many years, Hartung has been eloquently arguing for power analysis *prior* to the start of a study, so that adequate number of patients are enrolled and negative results are not due to a type II error.[1,2] It is therefore surprising that his analysis excluded the most powerful study of the effects of nitrous oxide on postoperative nausea and vomiting. The study by Muir *et al.* involved a total of 780 patients and had a power of 90% in detecting a *two-sided difference* in the incidence of postoperative nausea and vomiting of 0.16 at an α-level of 0.05.[3] Yet, Muir *et al.* failed to demonstrate a significant difference in the incidence of emesis between patients who received or did not receive nitrous oxide. Hartung rejected this study as more patients with a history of previous postoperative emesis were assigned to the non-nitrous oxide group. However, he has included other studies in his analysis where confounding factors associated with postoperative nausea and vomiting were not evenly distributed between the study groups.*[,4,5] For example, in the study by Alexander *et al.*, the group receiving nitrous oxide also received opioids in contrast to one of the groups receiving isoflurane without nitrous oxide.* In the study by Watcha *et al.*, prophylactic droperidol was administered to some of the patients but not to others.[4] In the study by Eger *et al.*, some patients underwent spinal anesthesia, whereas others did not.[5]

We believe it is an oversimplification to perform a meta-analysis by simply pooling all cases who received or did not receive nitrous oxide (regardless of other drugs used). The selection process of trials to be included in a meta-analysis should be rigorous and uniformly applied to all trials.† In addition, the statistical tests used should be chosen on a consistent basis. For example, Hartung has used a one-tailed Fisher's exact test rather than a two-tailed test to achieve a P value of $<.05$ for the data by Eger *et al.*[5] This approach is valid only if one assumes that nitrous oxide increases emesis. We submit that several well controlled studies in the anesthesia literature*[,3,5,6,7] do not support Hartung's suggestion that the association of nitrous oxide with emesis has been shown "beyond the shadow of a doubt."

We would encourage Hartung to perform a study of the effects of nitrous oxide on postoperative emesis in an "at-risk" patient population undergoing the same operative procedure where other confounding factors have been carefully controlled during the postoperative period and the number of patients enrolled in the two study groups is adequate to avoid a type II error. These data will be more convincing than an argument based on the selective use of statistical tests and clinical studies designed to answer other questions.

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Combined Spinal-Epidural Anesthesia Using Needle-through-needle Technique

To the Editor:—Recently kits for producing combined spinal-epidural anesthesia (CSE) using a "needle-through-needle" technique were produced. B. Braun Medical Ltd. produces a kit with a standard Tuohy needle and a spinal needle that extends 13 mm beyond the tip of the Tuohy needle (fig. 1). Another CSE kit (Vygon Ltd.) has a modified Tuohy needle with an aperture in its curve (back hole) for the insertion of the spinal needle, which protrudes 10 mm beyond the tip of the epidural needle (fig. 2). With the aperture for the spinal needle differing from the path of the epidural catheter, it is suggested that insertion of the catheter through the dural puncture would be less likely. We compared these two kits in 40 consecutive patients presenting for total knee arthroplasty, assessing any difficulty in performing the blocks or any specific complication of the technique.

All the blocks were performed by the same operator. The epidural space was identified using the loss of resistance to air technique. The spinal needle was advanced until the tip was felt to puncture the dura. After appearance of cerebrospinal fluid (CSF), 2.5 ml 0.5% plain bupivacaine was injected. The spinal needle was withdrawn and the epidural catheter inserted and flushed with normal saline. In the recovery room, when there was evidence of regression of the motor block, an infusion of 0.1% bupivacaine with fentanyl (2 μg/ml) was started after a test dose of 3 ml 2% lidocaine with adrenaline. Infusion rate varied between 4 and 10 ml/h.

Insertion of the Tuohy needle and identification of the epidural space was achieved without difficulty in both groups. Protrusion of the spinal needle proved inadequate and dural puncture was not achieved in three patients (15%) in the Vygon group. Dural puncture was successful when a longer needle was used. The length of spinal needle was adequate in the Braun group. Several drops of clear fluid were observed at the hub of the Tuohy needle on withdrawal of the spinal needle in seven patients in the Braun group and five patients in the Vygon group. At this stage, fluid could not be aspirated through the Tuohy needle with a syringe. In no case was the volume of fluid large nor was the flow persistent. This fluid may be caused by drainage from the spinal needle or possibly a small leak from the dural puncture. All patients had good surgical anesthesia and postoperative analgesia. None of the patients had unexpectedly high sensory blocks with the epidural infusion in the postoperative period.

The feel of the needle puncturing the dura was absent when using the Braun set. This could be due to the fact that the spinal needle has to brush the curved bevel of the Tuohy needle. The spinal needle in the Vygon set had a smoother feel to insertion and dural puncture was more easily felt. The spinal needle in the Vygon set could curve along the bevel of the Tuohy needle; to prevent this it is necessary to advance the spinal needle slowly while bending the hub toward the bevel of the Tuohy needle (fig. 3).

In conclusion, satisfactory surgical and postoperative analgesia from combining spinal and epidural techniques respectively using CSE were obtained in patients undergoing total knee arthroplasty. One concern with the technique is finding CSF in the Tuohy needle after

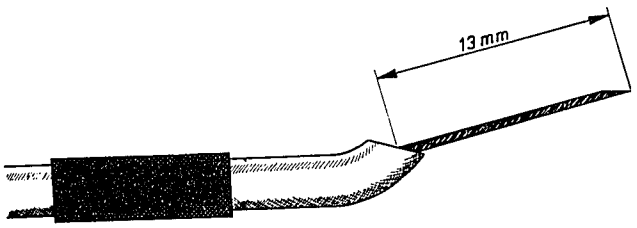

Fig. 1. The Braun CSE set.

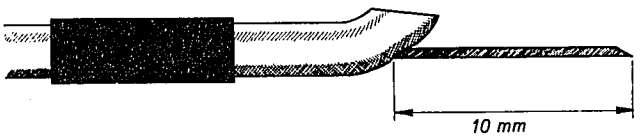

Fig. 2. The Vygon CSE set.

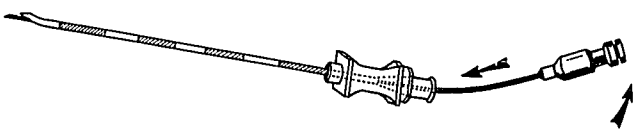

Fig. 3. The technique to direct the spinal needle through the aperture in the Tuohy needle.