

## CORRESPONDENCE

under negative pressure ventilation. We presented negative pressure ventilation as another possible option on such occasions.

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## Postanesthesia Care Unit Costs

*To the Editor:*—A recent paper assessing strategies to decrease postanesthesia care unit costs<sup>1</sup> makes use of questionable methodology. It shows that "charge-benefit" studies are still being published and are still called cost-effectiveness studies. Although the authors mention that "... charges do not necessarily represent costs," they take the position that "... relative ... charges are accurate proxies for relative costs." The accepted way to analyze costs is through activity-based costing. Furthermore, the difference between costs and charges (the mark-up) differs throughout a hospital's cost centers.

In addition, the number of personnel required does not depend on the peak number of patients in the postanesthesia care unit. One of the benefits of cost-effectiveness studies is the ability to provide to policy-makers alternatives in resource allocation.

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*In Reply:*—Cost-effectiveness studies compare the costs of different therapies to achieve the same outcome. In the part of our study that used charges, we did not do a cost-effectiveness analysis. Instead, we addressed whether strategies to decrease postanesthesia care unit (PACU) supply costs would decrease PACU costs substantively. They would not. Hagan points out that "one of the benefits of cost-effectiveness studies is the ability to provide to policy-makers alternatives in resource allocation." Although I agree, I think that other types of cost analyses can be beneficial. This minor part of our study was a valuable prelude to most of our analysis.

To assess the significance of supplies on PACU costs, we used relative charges as proxies for relative costs. We did not make this assumption capriciously but did so based on studies that have evaluated the validity of the relationship.<sup>1,2</sup> Nevertheless, the important question is not whether relative charges are statistically different from relative costs. They will be under many circumstances. The important question is whether the degree of inaccuracy is sufficient to affect our conclusions. Charges for supplies accounted for 2% (95% confidence

interval 0-3%) of the PACU bill. Therefore, I think that a change in the analysis is unlikely to show that supplies were a major part of the bill. We could have increased our sample size. However, I am skeptical that we then would have found supplies to be important cost items in the PACU.

Finally, Hagan states that "the number of personnel required does not depend on the peak number of patients in the [PACU]." If this statement were true, our results would be of little value. However, the claim is incorrect. The American Society of Post-Anesthesia Nurses (ASPAN) recommends that each PACU nurse care for two or fewer patients simultaneously. Following their standard, the peak number of nurses required equals half the peak number of patients.

Hagan's point about the number of personnel leads to the question of whether PACU personnel costs are proportional to the peak number of patients in the PACU. This relationship between cost and peak number of patients will hold for almost all PACUs. However, there are exceptions. The relationship assumes that there are dedicated PACU nurses. For example, some ambulatory surgical centers do not

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have dedicated PACU personnel. By having these nurses perform other (non-PACU) duties when they are not needed in the PACU, perioperative costs can be decreased. I do not know of a study that has assessed whether this cost-saving approach affects the quality of patient care.

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## Nasal Midazolam in Children

*To the Editor:*—Davis *et al.* described the use of intranasal midazolam as preanesthetic medication in children.<sup>1</sup> However, the authors did not describe how many children cried when given the intranasal medication nor how long they cried. Were the parents satisfied with the experience, and would they elect intranasal medication again? Karl *et al.* found a 71% incidence of crying in children given intranasal medicine *versus* 18% for the sublingual route.<sup>2</sup> Furthermore, oral administration of 0.5 mg/kg midazolam has been shown to improve the quality of anesthesia induction without delaying discharge time.<sup>3</sup>

A second issue is that many medical liability insurance carriers (e.g., Norcal Mutual) do not cover a physician using a medication without the Food and Drug Administration (FDA) label. Midazolam is not approved for use in children by the FDA. We are often consulted by our pediatric and emergency room colleagues for an oral method of sedating a child either for suturing or for diagnostic imaging procedures. We may be giving them advice that jeopardizes both their and our medical liability insurance coverage.

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*In Reply:*—Orman raises two important issues. The ideal route of preanesthetic drug administration in children has yet to be defined. Acceptability, effectiveness, and recovery profile are all factors in assessing a drug's utility as a preanesthetic medication. Nasal midazolam can be irritating and cause crying during the first minute after administration. Although we do not have formal statistics on parent/child acceptance, at our institution many parents ask to take nasal midazolam (the nose drops) home for use after surgery.

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The second issue raised by Orman—drug use for unapproved indications in pediatric patients—is a serious and ethically disturbing matter. Pediatric anesthesiologists frequently administer medications for indications that are not included in the labeling approved by the Food and Drug Administration (the package insert). As Orman suggests, this practice places the physician at risk both legally and financially. In addition, the lack of approved drug labeling has made children “therapeutic orphans” (table 1). Children of all ages deserve