

CORRESPONDENCE

Anesthesiology

1997; 87:1583-4

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The Successful Implementation of Pharmaceutical Practice Guidelines? Far From Convincing!

To the Editor:—We are not convinced that the savings reported by Lubarsky *et al.*¹ are as great or as real as suggested. The authors conclude that their pharmaceutical practice guidelines, once implemented, resulted in an annual saving of almost 1 million dollars. The institution of this practice was associated with several other effects, including an increase of 3 min on average in the time from the end of surgery to arrival in the postanesthesia care unit (PACU) for each anesthetized patient. Although the authors state that they did not believe this increase was clinically significant, nor that operating rooms would be forced to cancel or delay cases, the fact remains that additional time equates to additional costs. The statement that overtime and associated increases in pay would not result from such increases in workload does not reflect the reality of many operating room environments.

What is relevant and appropriate for the cost analysis used in this report is to quantify the added cost related to this increase in time, which was reported to be statistically significant. Why this was not performed is unclear. Sperry² points out that it is essential for every economic study to identify which costs are counted and which are excluded. Conservative estimates of operating room costs are at least \$8.13/min but can range much higher.³ For simplicity sake, using an estimate of \$10/min as the cost of operating room time, increases of 3 min per case, for a total of 27,728 cases per yr (the number reported to be the annual volume at Duke University Medical Center), equates to an increased cost of \$831,840. This amount actually exceeds the annualized savings of \$647,000 that the authors attributed directly to the implementation of their pharmaceutical practice guidelines. Such a result is consistent with what Lubarsky *et al.* noted others to report: that such guidelines can increase, not decrease, costs.⁴ Although other costs were discussed, such as the cost of implementing the particulars of the pharmaceutical practice guidelines, readers were left with the impression that savings were substantial and that the guidelines were an overwhelming success.

Additional costs can also be attributed to unplanned PACU admissions. If PACU costs are estimated to be one fourth of the operating room rate, the increase in unplanned PACU admissions that followed the implementation of the pharmaceutical guidelines, if annualized, would result in additional expenditures of \$91,900. We recognize that this and the above calculations are simplistic. However, they illustrate that several different assertions can be made, depending upon which pieces of the puzzle one focuses. Without a more complete analysis, the report by Lubarsky *et al.* and, in particular, its strong conclusions can be misleading.

Other issues that such analyses do not and maybe cannot address involve other potentially negative effects that such practice guidelines may have on practitioners or patients. Just a few serious negative outcomes could easily eliminate all possible savings. Guidelines that mandate clinicians change one or several components of their practice, such as the anesthetic agents with which they are familiar and are expert at administering, cannot fully consider how such changes

might negatively impact the care they give and patient outcome. Although frustrating, it may be that "all that counts cannot be counted".²

One premise underlying the restriction of choice of opioids suggested by the authors is that all μ -agonists are pharmacodynamically without much difference. However, under many circumstances, different effects result from the administration of one opioid *versus* another. Often, these differences can be attributed to a combination of pharmacodynamic and pharmacokinetic properties, which distinguish each agent.

The following serves as a simple but common example. Before the induction of general anesthesia, opioids are frequently administered to control the hemodynamic response to tracheal intubation. With fentanyl, frequently neither an adequate dose ($3-7 \mu\text{g/kg}$)^{5,6} of fentanyl is administered, nor is enough time (5 min) allowed to pass before stimulation, for optimal hemodynamic control with this opioid. In contrast, the added drug costs of alfentanil or remifentanyl when used in the same setting may be offset by taking advantage of the reduced time (1 min) to their maximal effect compared with fentanyl.⁷ In addition, the use of alfentanil and propofol in combination allows tracheal intubation with very good conditions without the use of muscle relaxants.⁸ The use of reversal agents is thus avoided, as are their possible attendant side effects. An analysis of the cost of such an anesthetic, we would argue, may support the use of the more expensive agents.

Although Lubarsky *et al.* have undertaken a difficult task, we are concerned with the message of their report. The conclusions of such cost analyses remain oversimplifications of our complex world. As such, they paint a picture that some will find appealing and that others will use to achieve certain ends. We are not of the former, and we fear the latter.

Peter L. Bailey, M.D.

Talmage D. Egan, M.D.

Department of Anesthesiology
University of Utah Health Sciences Center
50 North Medical Drive
Salt Lake City, Utah 84132
pbailey@anesth.med.utah.edu

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(Accepted for publication July 29, 1997.)

Anesthesiology
1997; 87:1584
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Lippincott-Raven Publishers

In Reply:—We appreciate the concerns that are raised by Drs. Bailey and Egan in their letter. However, their primary contention, that the extra 3 min per case that are spent between the operating room (OR) and the postanesthesia care unit (PACU) would negate all savings in drugs costs, is fallacious. Their misconception is a common one (repeated in Dr. Riley's letter), so it merits a more complete explanation here. Only a partial explanation (because of limitations on length) can be found in the text of our article. Although it is true that the OR is an expensive environment, it is an expensive environment for a variety of reasons, including administration, cleaning, nursing labor, equipment, and so on. The behavior of most OR costs¹ is such that no actual savings are generated from such a small (3 min) change in operational efficiency. A simplified explanation of the way that hospital accounting systems routinely calculate OR costs/min is necessary to understand this. First, all expenditures are summed and put in the numerator, and all minutes of operation become the denominator. Shaving 3 min from each case does not change any cost that goes into figuring the numerator. Labor costs are unlikely to change, even in institutions who pay their nurses by the hour rather than by the shift. The 3 min added per case in our study, at most (see below) would simply increase the number of minutes (the denominator) used by the hospital accounting system and serve to decrease the cost/min for running the OR. Actual dollars spent would not change. The accounting criticism that Drs. Bailey and Egan (and Dr. Riley, see next letter) offer is not valid in the real world of hard currency.

Looking at this from another angle, if one were to approach any OR director and say, "I can cut three minutes off of each and every case if you simply hand me 1 million dollars," not a single OR manager in the United States would make that deal. That is because no real savings in dollars accrue to the institution; all that happens is the cost/min of running the OR would increase slightly to account for the fact that the same costs are spread out over fewer minutes of operation.

Further, we did not measure the actual turnover time between cases during this period. It is entirely conceivable that the extra couple of minutes that were required were not wasted by the OR nurses as they broke down their trays, and therefore no extension of operating room time occurred.

The same reasoning used in assessing the "costs" of a few added

minutes applies to the extra PACU admission. The extra 45 min/day of work, at a random interval, in exchange for 1 million dollars/yr savings, would be considered a good bargain. Patients recovering from MAC anesthesia, if they do need recovery room care, do not usually require the same close supervision as someone recovering from a long general anesthetic. The actual cost to the institution is negligible.

There are always physicians who respond strongly to any discussion of practice guidelines. Their concerns may be legitimate, or they may simply reflect a fear of doing things differently from what has been done in the past and which are viewed as "tried and true." In this case, Drs. Bailey and Egan suggest the superiority of certain narcotics. If it really made a difference what narcotic one chose, we would all choose the best one. We all have our patients' best interests at heart. The fortunate news (or unfortunate news if one is in the narcotic research business) is that it is not what drugs one administers but how one administers them that really makes a difference. We would welcome further outcome studies that would document the advantages of the more expensive drugs in a clinical setting. The differences between drugs seen in randomized, controlled studies cannot always be realized in the complex arena of perioperative patient flow.

We are well aware of the limitations of our study, although our conclusions are valid. The cost savings are real. The institution is better because of the efforts we have made. And our patients are just as safe.

David A. Lubarsky, M.D.
Department of Anesthesiology
Duke University Medical Center
Box 3094
Durham, North Carolina 27710

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(Accepted for publication July 29, 1997.)