

EDITORIAL VIEWS

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Meaningful Cost Reduction

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The American health-care system is undergoing nothing short of revolution, despite failure to legislate national health-care reform. Competition has emerged as a potent force in a health-care marketplace undergoing domination by managed-care plans and horizontal and vertical networks. As part of their cost-reduction strategy, managed-care health insurance plans have successfully decreased use of costly medical services (including those provided by anesthesiologists) and negotiated large discounts from both hospitals and physicians. As demand for hospital-related care shrinks, hospitals and physicians have joined in unprecedented mergers and alliances to secure access to patient populations and, it is hoped, their survival.

Not unexpectedly, in their individual workplaces, anesthesiologists encounter increasing pressure to control if not decrease costs related to the care they provide. We are exhorted to use older, less costly drugs and help decrease delays between surgical cases, among myriad other potential cost-saving initiatives. Where should our efforts be directed? More to the point, what are the determinants of the cost of a surgical hospitalization? Where can we have the greatest effect?

In this issue of ANESTHESIOLOGY, Macario *et al.*¹ provide some guidance. Culling data from the financial information system of a university hospital, they tracked the costs and charges generated during the care of 715 inpatients having one of four common, intermediate-complexity surgical procedures. Using the taxonomy of the cost accountant, their data source identified the direct and variable portions of the costs related to individual patient encounters, as opposed to general support of the hospital, and, thus, more amenable to modification by the physician's clinical decision-making. Dissection of their database enabled the investigators to study the relationship between costs and charges, apportion total cost among the different hospital departments and clinical units, and identify relative opportunities for physician-led cost reduction.

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Particularly important at a time when charge data are increasingly (and inappropriately) used in clinical economics, Macario *et al.* provided an excellent example of the underappreciated, poor relationship between cost and charges.^{2,3} Charge (*e.g.*, patient bills) and cost (*e.g.*, drug acquisition cost) data often are erroneously used interchangeably. Charges are greater than costs by an amount that enables the hospital to invest in its infrastructure, cover some uncompensated care, and subsidize money-losing services. Charges are akin to list prices, usually set to maximize hospital revenue. Only the very small fraction of patients who self-insure pay charges, because all other payers control sufficient hospital admissions to command discounts, and, in accordance with their relative success in negotiating, hospitals often maintain multiple price lists. As a result, there is no fixed relationship between costs and charges across hospital services, with the cost-to-charge ratio varying threefold among departments in this study. For this reason, evolving guidelines for the economic evaluation of health-care interventions specify cost rather than charge data.⁴⁻⁶ Of special note, because of these inherent distortions, the use of charge data overestimated the anesthesiology department's resource consumption by 48%.

Anesthesia costs comprised about 6% of total hospitalization costs, with about half being classified as direct or variable costs; thus, about 3% of total hospital costs were subject to the anesthesiologist's clinical decision-making and potentially substrate for cost savings. How much could be saved? Johnstone showed that an aggressive cost-education initiative directed at substitutions for the anesthetic drugs among the hospital's "top 10" drug expenditures resulted in savings of about 23% in the department's drug budget.⁷ Assuming that similar cost savings could be extended to the other anesthetic drugs (*e.g.*, low-flow inhalation anesthetic delivery) and disposables (*e.g.*, intravenous supplies, airways, syringes) comprising the rest of the 3% of total hospital costs allocated to the anesthesiology department and classified as direct or variable costs, the decrease in total hospital cost would be only about 0.7% ($0.23 \times 3.0\%$). The "good news" is this seemingly tiny savings

would achieve importance in the aggregate as it were multiplied by the thousands of surgical admissions each year in each hospital. However, the "bad news" is that cost savings generally are not sustainable in the absence of continuing effort to maintain altered physician practice patterns.^{7,8} Thus, however urgent that we achieve savings where possible in our drug choices and other aspects of anesthetic management, the results are likely to be disappointing to our colleagues in the hospital pharmacy and administration, as well as ourselves.

Yet, are our opportunities for cost savings really so limited? Are the apparent limited savings merely an artifact of the limited perspective imposed by the cost accountant's allocation scheme? If we widen our horizons, we can identify other ways to achieve additional (and more substantial) cost savings that are suggested by this study. For example, tracking variable and direct costs, the investigators found similarly small opportunities for cost savings in other hospital sites—the clinical laboratory, radiology department, blood bank, postanesthetic care unit, and intensive care unit—where the anesthesiologist may have considerable influence on resource use.

Even greater cost-saving opportunities are likely in the operating room, which accounted for one-third of total hospital costs, with about 44% of the costs classified as variable or direct, resulting in a potential 15% of total hospital costs especially amenable to modification. The labor-intensive, equipment-intensive operating room is clearly ripe for cost savings, given the high expense of each minute there. The challenge is to achieve cooperation among the surgeons, nurses, anesthesiologists, and administrators in developing clinical and managerial solutions. These solutions may involve redesign of long-cherished traditions and systems, resulting in improved quality (which is sometimes cost-saving) as well as savings. That meaningful savings is not only possible but potentially substantial is suggested by the experience of the University of Michigan Medical Center, which achieved a net savings equal to 2.2% of total hospital costs in its operating room during a 4-yr quality improvement project; interestingly, this savings amounted to about three-quarters of the savings achieved throughout their medical center.⁹

Additional savings of a distinctly clinical sort are also likely on the ward, whose variable and direct costs accounted for 12% of total hospital costs that seem amenable to modification. Enhanced pain therapy begun as part of the anesthetic management (*e.g.*, epidural

opioids) may result in fewer (often costly) complications and a shorter length of hospital stay for patients having major joint replacement,¹⁰ esophagectomy,¹¹ or colon surgery,¹² among other major procedures in high-risk patients.¹³ Similarly, patient-controlled analgesia also decreases complications and hospital stay.¹⁴ Just as we plan our anesthetic management with such benefits in mind, the resultant cost savings constitutes "downstream" effects that should not be overlooked in the economic evaluation of our care. Interestingly, although enhanced pain management undoubtedly increases the "anesthesia costs," the "downstream benefit" more than compensates for the additional cost.

Thus, we should not limit our perspective to merely seeking to decrease the anesthesia pharmacy costs, lest we become blindsided to far greater cost-saving opportunities. In the past, achieving cost savings external to one's budgeted domain might have been less appealing, if not a disincentive. With the aggregation of clinical entities into larger functional units, there is need for enlightenment transcending departmental budgets. Indeed, the evolving guidelines for the economic evaluation of health-care interventions recommend the broadest perspective possible.⁴⁻⁶ We must consider the entire surgical experience, preoperatively and postoperatively, to identify the related cost savings and other implications of our anesthesia management. Otherwise, we risk being penny wise, pound foolish.

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References

1. Macario A, Vitez TS, Dunn B, McDonald T: Where are the costs in perioperative care? Analysis of hospital costs and charges for inpatient surgical care. *ANESTHESIOLOGY* 83:1138-1144, 1995
2. Finkler SA: The distinction between cost and charges. *Ann Intern Med* 96:102-109, 1982
3. Orkin FK: Moving toward value-based anesthesia care. *J Clin Anesth* 5:91-98, 1993
4. Guidelines for Economic Evaluation of Pharmaceuticals: Canada. 1st edition. Ottawa, Canadian Coordinating Office for Health Technology Assessment, November 1994
5. Task Force on Principles for Economic Analysis of Health Care Technology: Economic analysis of health care technology: A report on principles. *Ann Intern Med* 122:61-70, 1995

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6. Rittenhouse BE: Standards for economic evaluation of drugs. *Med Care* (in press)
7. Johnstone RE, Jozefczk KG: Costs of anesthetic drugs: Experiences with a cost education trial. *Anesth Analg* 78:766-771, 1994
8. Greco PJ, Eisenberg JM: Changing physicians' practices. *N Engl J Med* 329:1271-1273, 1993
9. Gaucher EJ, Coffey RJ: *Total Quality in Healthcare: From Theory to Practice*. San Francisco, Jossey-Bass, 1993, p 25
10. Mahoney OM, Noble PC, Davidson J, Tullos HS: The effect of continuous epidural analgesia on postoperative pain, rehabilitation, and duration of hospitalization in total knee arthroplasty. *Clin Orthop* 260:30-37, 1990
11. Smedstad KG, Beattie WS, Blair WS, Buckley DN: Postoperative pain relief and hospital stay after total esophagectomy. *Clin J Pain* 8:149-153, 1992
12. Liu SS, Carpenter RL, Mackey DC, Thirlby RC, Rupp SM, Shine TSJ, Feinglass NG, Metzger PP, Fulmer JT, Smith SL: Effects of perioperative analgesic technique on rate of recovery after colon surgery. *ANESTHESIOLOGY* 83:757-765, 1995
13. Yeager MP, Glass DD, Neff RK, Brinck-Johnsen T: Epidural anesthesia and analgesia in high-risk surgical patients. *ANESTHESIOLOGY* 66:729-736, 1987
14. Ballantyne JC, Carr DB, Ulmer J, Jacox A, Mahrenholz D: *The control of postoperative pain, Medicine Worth Paying For: Assessing Medical Innovations*. Edited by Frazier HS, Mosteller F. Cambridge, Harvard University, 1995, pp 109-122