

CORRESPONDENCE

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Rural Realities

To the Editor:—Dr. Orkin's editorial view on rural realities¹ adds one more contribution to his long list of epidemiology studies on anesthesia practice. However, the editorial commentary on the distribution of anesthesia personnel in rural areas did not reflect reality in a number of points. Although we applaud Dr. Orkin's attempt to identify the factors influencing the numbers of anesthesiologists and nurses anesthetists who work in underserved area, the author admits that the data were obtained from an annual survey conducted by the American Hospital Association and answered by hospital administrators.

We relocated to the Florida panhandle in 1989 and have lived in Walton County, which has about 31,000 inhabitants. Because of our interest in rural hospital services and management, we are also well informed of the anesthesia-related situations and the hospitals' statistics for other adjacent rural counties, such as Washington, Holmes, Gulf, Franklin, and Jackson, which have one hospital each with a small bed capacity (table 1).

The ratio of anesthesiologists to 100,000 population in northwest Florida is erroneous, as far as the shaded areas shown in Dr. Orkin's figure 1 are concerned. There is one anesthesiologist in Walton County and one nurse anesthetist; other hospitals have one nurse anesthetist each covering between 20–40 cases per month, except for in Franklin County, which has four CRNAs providing anesthesia coverage for about 90 cases per month. Dr. Orkin's map is an incorrect representation of anesthesiologists per 100,000 population in this part of the country. By incorporating two non-rural counties such as Okaloosa County with 14 anesthesiologists and Bay County with 9 anesthesiologists, all the adjacent rural counties shown in figure 1 appear to have 7 anesthesiologists per 100,000, when in fact there are only 2.

We have been aware of anesthesiologists wanting to practice in these hospitals; however, administrators have not only been uninterested, but at times they have been openly hostile. The reason is economics because even with only 30–40 cases per month, by employing a CRNA for about 60,000–70,000 dollars per year, they actually profit more by billing for the

medications, supplies, equipment and for the professional fee. Therefore, hospitals are not eager to have anesthesiologists.

Finally, case reviews and analysis of pre- and postoperative complications and deaths are seldom conducted in a proper manner, making quality assurance a family affair. Deaths and complications are not discussed and go unreported, and because litigation is scarce in this location, the AHA statistics do not reflect reality as far as morbidity is concerned. The reports describing no anesthesia-related deaths in these hospitals is a myth because there are powerful reasons to cover them up.

Nevertheless, anesthesiologists should consider going into rural areas not expecting a certain number of cases set up for them, nor a guaranteed income, but with the mission to join the community and build practice as any other specialist would do based on professionalism, availability, and competence. Incorporation of Pain Management, for example, could help to establish their own base of patients for whom they will be providing medical care and making treatment decisions. Hopefully then, emancipation from "consultant only" stigma may elevate the spirits of some anesthesiologists.

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Reference

1. Orkin FK: Rural realities. *ANESTHESIOLOGY*, 1998, 88:568–71

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In Reply:—I am pleased that the Drs. Aldrete share the interest in and concern for the adequacy of anesthesia care in the rural United States expressed in my editorial.¹ They note an apparent discrepancy between their assessment of the availability of anesthesiologists in their Florida panhandle region and that depicted in figure 1. That illustration is a map of the geographic distribution of anesthesiologists across the United States, which was developed from the data and "viewer" software in the CD-ROM accompanying *The Dartmouth Atlas of Health Care 1998*.² Although not involved in that mapping project, I can offer some reasons for the discrepancy, as well as comment on the Aldretes' other unrelated concerns.

The Aldretes' assessment of anesthesiologists' availability in their region relates presumably to the current situation (*i.e.*, 1998), whereas the *Atlas* is based on the latest available national data (1996) collected in the American Medical Association and American Osteopathic Association surveys, unique data sources used widely for public and private physician workforce analyses. In contrast to the Aldretes' tabulations of hospital-associated personnel, these data sources also include physicians working in non-hospital settings (*e.g.*, hospital-independent, freestanding surgery center; pain management office practice). More important, the Aldretes' assessment relates to their region's seven rural (and nine total) *counties*, whereas an early finding of the *Atlas* project

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was that geopolitical areas (e.g., counties) correspond poorly to where patients actually receive their medical care. The areas mapped in figure 1 are the *hospital referral regions* that are defined by where Medicare patients were hospitalized for major cardiovascular and neurosurgical procedures. The Florida panhandle region overlaps with four such hospital referral regions, one of which has its greatest land coverage in neighboring Alabama: Pensacola (9.7 anesthesiologists/100,000 population), Panama City (7.2), Tallahassee (7.6), and Dothan (7.6). Hence, comparing the Aldretes' assessment and what is mapped in figure 1 is much like comparing apples and oranges.

The Aldretes also seem to impugn physician data obtained in the American Hospital Association's Annual Survey mailed to hospital administrators. In years in which AHA has inquired about physicians, the survey has specified medical staff membership at the time of the survey, leaving little subjectivity. The administrator has also been a most appropriate person to complete the form in relation to studies of anesthesiologists' availability, given that so many hospitals lack anesthesiologists (e.g., about one third nationally,³⁻⁶ 69% in rural Washington and Montana,⁷ and 71% in rural counties of the Florida panhandle according to the Aldretes). Thus, AHA Annual Survey data have enjoyed usage in ASA,^{3,4} personal,^{5,6} and other anesthesia-related studies⁸ in which the hospital is the unit of analysis.

Like the Aldretes, I would encourage anesthesiologists to consider rural sites, even though the challenges of developing a physician-directed anesthesia practice *de novo* may be substantial.

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References

1. Orkin FK: Rural realities. *ANESTHESIOLOGY* 1998; 88:568-71
2. Wennberg JE, Cooper MM: The Dartmouth Atlas of Health Care 1998. Chicago, American Hospital Publishing, 1998
3. Committee on Manpower, American Society of Anesthesiologists (Orkin FK, project director): The Geographical Distribution of Anesthesia Care Providers in the United States, 1981. Park Ridge, IL, American Society of Anesthesiologists, 1983
4. Rosenbach ML, Cromwell J: A profile of anesthesia practice patterns. *Health Aff (Millwood)* 1988; 7:118-31
5. Orkin FK: The geographic distribution of anesthesiologists during rapid growth in their supply (abstract). *ANESTHESIOLOGY* 1994; 81:A1295
6. Orkin FK: Why do anesthesiologists shun rural hospitals? *Anesth Analg* 1996; 82:S348
7. Dunbar PJ, Mayer JD, Fordyce MA, Lishner DM, Hagopian A, Spanton K, Hart LG: Anesthesia personnel availability in rural Washington and Montana. *ANESTHESIOLOGY* 1998; 88:800-8
8. Silber JH, Williams SV, Krakauer H, Schwartz S: Hospital and patient characteristics associated with death after surgery: A study of adverse occurrence and failure to rescue. *Med Care* 1992; 30:615-29

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The Blood Sparing Effect of Aprotinin Should Be Revisited

To the Editor:—Capdevila *et al.*¹ noted that the mechanism underlying the beneficial effect of aprotinin was not fully elucidated. We wish to make some comments in this regard. The blood-sparing effect of aprotinin has long been attributed to an early protective effect of aprotinin on platelet membrane glycoproteins, mainly Gp1b, altered by the contact of blood components with the foreign, non-biological surface of the cardiopulmonary bypass circuit (CPB).^{2,3} Until recently the blood-sparing effect of aprotinin was only demonstrated in cardiac surgery conducted with CPB. During CPB, inhibition of fibrinolysis by aprotinin^{3,4} could explain the protective effect on platelet membrane glycoproteins. Plasmin and d-dimer may degrade Gp1b receptors and the von Willebrand factor, which is responsible for platelet adhesion.^{3,4} However, the inhibition of fibrinolysis is unlikely to be the mechanism by which aprotinin reduces intraoperative blood loss with CPB: the activation of fibrinolysis is apparent only at the end of CPB,³ whereas the Gp1b receptor consistently decreases within 5 min after start of CPB.³ Also, as noted by the authors, the reduction of intraoperative cytokine release by aprotinin has been assessed when a CPB is used.⁴ However, this effect has never been associated with any hemostatic changes.⁵

The intraoperative blood-sparing effect of aprotinin has been demonstrated in situations in which CPB is not used: elective liver resection⁶ and orthopedic surgery.^{7,8} Consequently, the blood-sparing effect of aprotinin cannot be attributed primarily to a protective effect on platelet function previously altered by the contact of blood cells with the non-biological surface of a CPB. However, available data are controversial. Inhibition of intraoperative hyperfibrinolysis has been demonstrated in elective liver resection.⁶ Conversely, in two prospective, randomized, placebo-controlled studies of hip surgery,^{7,8} a reduction in blood loss with high-dose aprotinin occurred but without any associated antifibrinolytic effect.^{7,8} In these two studies, fibrinolysis was assessed by two reliable tests: postoperative fibrinogen⁷ and d-dimer concentration.⁸ The effect of aprotinin on platelet function was investigated in two randomized, placebo-controlled studies of hip replacement surgery.^{7,9} In the former study,⁷ in the aprotinin and placebo groups: (1) the intraoperative platelet count and the bleeding time did not change significantly; (2) no evidence of *in vivo* intraoperative platelet activation was found (b thromboglobulin remained normal); and (3) no significant change in *in vitro* intraoperative ADP and collagen-induced platelet aggregability was observed. In the latter