

## REPORTS OF SCIENTIFIC MEETINGS

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### Quality of Care Review in Anesthesia

Forty-four anesthesiologists, nurse anesthetists, bio-engineers, biostatisticians, epidemiologists, and hospital administrators met in Pittsburgh on June 20–21, 1980, to discuss quality of care review in anesthesia. Coordinated by Betty L. Grundy (University of Pittsburgh) and J. S. Gravenstein (University of Florida), the workshop was sponsored by the Department of Anesthesiology and Critical Care Medicine of the University of Pittsburgh.\* Sessions were devoted to structure, process, and outcome of anesthesia care, and resultant policy implications, with time divided equally between short papers and discussion.

Dr. Gravenstein opened the session on the structure of anesthesia care by reviewing several studies of the impact of training on quality of care which suggested that training and experience are associated with better outcomes. However, the results in these studies had not been adjusted for patient mix and, in other studies, supervision of inexperienced physicians was associated with outcomes more similar to those of more experienced physicians. The impact of technology on anesthesia care was discussed by Marvin Skolnick (University of Texas, Houston). Advances in semiconductor technology have made available more information than can be used. In the future, available computer technology might be used for pattern recognition of EEG or ECG tracings or to assess performance of providers (by their adherence to appropriate algorithms), as well as more familiar uses such as physiologic monitoring or simulation of clinical situations for educational purposes. Sr. Mary Schram (Mount Marty College, Yankton, SD) discussed departmental guidelines and policies. Although she did not advocate "cookbook" approaches to anesthesia care, she indicated that guidelines are necessary particularly in those geographical areas where untrained and even non-medical personnel frequently give anesthesia because few knowledgeable, trained anesthesia personnel are available. Dr. Grundy described a scenario for "telehealth" in anesthesia, that is, an anesthesia care team concept that transcends institutional boundaries via a telecommunication system to provide long-distance preoperative and on-line intra-operative consultation for anesthesia providers in underserved areas. The equipment for such systems exists; it is uncertain, however, whether the constraints of limited funding and provider resistance to being observed can be overcome.

The session on the process of anesthesia care began with Larry Shuman's (University of Pittsburgh) discussion of the rationale for the use of algorithms, stepwise approaches which reflect the consensus of physicians' opinions about the correct approach to a problem. Compliance with the

algorithm can be assessed point by point by computer and a compliance score generated. Henrik Bendixen (Columbia University) proposed a model of the decision-making process in anesthesia: extraction and synthesis of essential data about the patient, procedure, and setting (an inductive process); design of a plan of action based on the collective past experience of the anesthesia community with similar problems; and, finally, checking and challenging the plan to determine its appropriateness for the given situation. Arthur Schneider (Case Western Reserve University) reported that 40 per cent of anesthesia records have serious errors. Yet, we rely on data generated from such records to make important therapeutic decisions. He made a plea for more data generated by machines, which provide more consistent and more accurate measurements than do people. Jeffrey Cooper (Harvard Medical School) reviewed his studies of anesthesia "near misses" and "direct hits" using the critical incident technique. The objective was to identify mechanisms by which human error and "system" design contributed to anesthetic risk, since the majority of anesthetic deaths appeared to be due to these factors and thus were preventable. He and his colleagues identified many design factors in anesthesia equipment that contributed to critical incidents, of which 5 per cent were associated with mild to severe consequences.

Opening the session on outcomes of care, Jeffrey Krischer (University of Florida) described problems in studying outcome. Anesthesia care is generally not therapeutic, and its adverse effects are often confounded with those of surgery, patient disease, and drug therapy. Outcome may be assessed at different times, each with possibly different results; an early outcome (e.g., death) can preclude later ones (e.g., hepatic failure). Outcome criteria often have been defined imprecisely and may not have adequately characterized quality of care. He urged that more attention be directed to the study of preventable outcomes. Judah Rosenblatt (Case Western Reserve University) urged the use of small, albeit imperfect, models without extrapolation beyond the range of the model. William Forrest (Stanford University) summarized a recent study which, however, did not examine the influence of anesthesia apart from other aspects of surgical care: in-hospital mortality (adjusted for patient characteristics) was studied among more than six hundred thousand patients treated in 16 acute-care hospitals selected randomly and stratified to insure differences in hospital characteristics. Mortality was related inversely to service intensity (and higher costs), length of surgical practice, explicitness of nursing policies, and control over new staff, among other organizational characteristics which, in combination, accounted for much of the variance in mortality. Despite inconsistencies, this work showed that data from chart abstracts, if adjusted for case mix, can be used to study differences among hospitals in quality of care delivered. In discussing cost-effectiveness as an outcome measure,

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Harvey Fineberg (Harvard School of Public Health) acknowledged inherent problems in assessing effectiveness comprehensively (*e.g.*, patient comfort and satisfaction), and validating and implementing analytic results. Yet, the method imparts a high degree of objectivity to decision making in choices between competing options, each with its own benefits and risks.

Policy implications for nurse anesthesia were discussed by Ira Gunn (American Association of Nurse Anesthetists), who reported that 95 per cent of this country's 16,200 nurse anesthetists are certified, and that a recertification process tied to continuing education has begun. She predicted increased numbers of anesthetists trained with stronger academic backgrounds. E. S. Siker (American Board of Anesthesiology) discussed policy implications more broadly, mentioning the inexorable progression in accreditation standards, among other regulations, to which we are all answerable. He reviewed the sharp decrease in foreign medical graduates in anesthesiology training during the 1970s. Without a compensatory increase in American graduates entering anesthesiology, coupled with increasing attrition as this relatively young specialty reaches its demographic maturity, the active pool of anesthesiologists will grow much more slowly and may even contract in the coming decade. Joel May (Health Research and Educational Trust of New Jersey) examined policy implications from the perspective of hospital administration. He reported that anesthesia services are often provided by incorporated groups whose members are isolated from hospital administration and medical staff collegiality. As a result, peer review tends to be internalized (*i.e.*, outsiders have difficulty scrutinizing anesthesia care), collegial resource allocation is modified (*e.g.*, anesthesiologists voice absolutism rather than compete), credentialing tends to be independent of the medical staff, and the administration tends to know

least about the needs of the anesthesiologist. He urged that the anesthesia care team interact more with hospital administration for mutual education, establish standards for care whenever possible, and compete more openly for resources within the institution.

The workshop ended on a somber note with Ernest Feigenbaum (National Center for Health Services Research), who reviewed the recent Institute of Medicine study which found little evidence of a relationship between health services research and innovation in the health care system; rather, alterations in the system seem to be linked to changes in society's values and expectations. Only meager funding is available from the (chronically underfunded) NCHSR for additional studies of topics that were discussed, despite the likelihood that such an investment would pay ample dividends.

Unfortunately, much less health services research is going on in anesthesiology now than three years ago, when the Association of University Anesthetists held a similar workshop to foster such activity. An edited transcript of the workshop will be published by the Charles C Thomas Company.

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