

thetia, the proponents appear to be less active and vocal than the opponents.

It is not necessary that anesthesiologists accept this interdiction of what is perhaps our safest and most satisfactory techniques. An illustration of this occurred in a northern California county where, about ten years ago, a well-known rancher became paraplegic following administration of a spinal anesthetic by his surgeon. A judgement of \$55,000 was made in his favor. This was followed by an extremely strong resistance to spinal anesthesia in that community, a resistance regularly reinforced by the sight of the paraplegic in his wheelchair. Yet, within the past two years, two well trained, personable and technically competent anesthesiologists have pioneered the practice of anesthesiology in this area. Gradually they have educated the medical and lay public, which had been complacently accepting some poorly administered general anesthesia. Now anesthetic methods including spinal anesthesia are selected on the basis of the medical requirements of each patient and operation rather than on fear of legal reprisal or emotional taboos.

In all areas of medical practice we must operate by patient requirements, physical status of the patient and the condition of the opera-

tion. Spinal anesthesia should not be singled out for local proscription any more than any other method.

Certain rules which seem obvious enough may be worth setting forth again as reminders for the safe preparation and conduct of any method of anesthesia but especially for subarachnoid block: (1) Visit the patient preoperatively. (2) Be rational in the choice of anesthetic agents and techniques. (3) Use what is medically indicated. (4) Make certain the patient understands your advice. Don't use subterfuge. (5) Write appropriate notes on the chart preoperatively. (6) Don't be shy or avoid questioning or legal problems. (7) Use meticulous technique. (8) Visit the patient postoperatively and write follow up notes on the chart.

Spinal anesthesia is well known and thoroughly understood. Its limitations are clearly defined. The indications for its use are generally accepted as are the physiologic principles underlying its application. Anesthesia should never be limited because of fear, ignorance, emotion or any reason other than responsible medical prescription.

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## Education in Anesthesiology

THE PROPOSED increase in duration of residency training to three years by the American Board of Anesthesiology has led to some organized opposition. The Council on Medical Education and Hospitals of the American Medical Association has agreed to conduct an open hearing, to allow those who oppose or support the increase to present their views. A review of the background and the events leading to the Board's proposal is warranted. The American Board of Anesthesiology was formed in 1937 as an affiliate of the American Board of Surgery, with support from the American Medical Association's Section on Surgery, the American Society of Regional Anesthetists, Inc., and the American Society of Anesthetists, Inc. In 1941 independent status was granted by the Advisory Board for Medical Specialists and approved by the Council on Medical Educa-

tion and Hospitals of the American Medical Association.

From the beginning the founders of the Board aimed to improve educational facilities in medical schools and practice in hospitals. In its Booklet of Information issued in 1939 the Board recommended a period of supervised instruction of at least two years prior to examination of candidates for certification. At the same time, however, the Board stated its belief that after January 1, 1942, facilities for special training would be increased and sufficiently standardized that a period of study of three years would be required. This plan of the Board was reprinted in 1941 so we must conclude that from the beginning the intent was to set a standard of three years of formal residency training. These aspirations were defeated first by the inadequacy of training facil-

ities and later by the advent of World War II. Meanwhile the specialty matured slowly with growth more apparent in general hospitals than in medical school centers. The directors of the Board semiannually discussed the original aim of three years of study which they believed was needed to produce a competent anesthesiologist, technically proficient in clinical practice and adequately trained in basic sciences and medicine as a whole.

The horizons of our specialty broadened during World War II. Since the War we have entered an era of development and progress in which anesthesiology and surgery have expanded rapidly, utilizing modern drugs and methods of research born of the electronic and nuclear age. However, education within the specialty has not paralleled this explosive growth, and we find many anesthesiologists as skillful technicians in the operating room but with deficiencies as physicians. These deficiencies have been demonstrated repeatedly during the oral examinations conducted by the Board.

Candidates who have passed the written examination at the termination of formal training often present themselves for oral examination three years later as practitioners too busy to have kept abreast of the medical times. Having had, in some instances, training narrow in scope it is apparent that their education ceased on graduation day. Many do not measure up to the performance expected by their examiners. Is this the fault of residency training? Will a third year of training change the situation? Again we can look to the past or beyond our American boundaries. Since 1946 there have been a few residency programs offering three years of integrated training. We have also observed the fellowship program in Canada in which a broad background of medicine is interwoven with three years training in anesthesiology. The product of these programs appears to approach in quality that expected, not only by the Board, but by diplomats acting as examiners at the oral examinations.

Criticism has been directed toward the Board for neglecting to set minimum standards for residency training. This is not a prerogative of the Board even though some Boards have assumed it. The Council and the Ad-

visory Board for Medical Specialists have recommended for two decades that education need not be obtained by any one rigid method of teaching and that a Board should not dictate or direct how the specialty shall be taught. Several different methods of instruction may serve the common objective of producing competent clinicians. Each approved program should examine its talents and shortcomings and decide the manner in which the resident is to be taught the material relevant to the practice of anesthesia.

The Council on Medical Education and Hospitals of the American Medical Association is closely allied to the Board through the Residency Review Committee. It is this latter Committee which now suggests minimum standards for residency training. These are published in the "Essentials of Approved Residencies and Fellowships" prepared by the Council and the new "Guide Book for Residency Programs in Anesthesiology" formulated by the Residency Review Committee for approval by the Council and the Board. Distribution of the Guide Book, planned for July 1959, was delayed when opposition to extending the duration of training became apparent. The Guide Book is to acquaint hospitals and directors of educational programs in Anesthesiology with the current thinking and standards of the Residency Review Committee. It is intended to express the Committee's interpretation of the principles set out in the Essentials and to give advice as to methods which have been found effective in teaching residents. The Guide Book should be published soon since it contains new and necessary information unrelated to time requirements for training residents.

Specifically, why is an additional year needed for training residents? If one thinks only of preoperative evaluation and preparation of patients for operation and moves in kaleidoscope fashion from twenty years ago to ten years and then to the present, is it not apparent that a revolution has taken place in the applications of physiology, chemistry and pharmacology to our understanding of the circulation and respiration both in health and disease? Is there not a voluminous literature of all phases of Anesthesiology? The effects of new drugs, alone and in combination, admin-

tered as chronic medication suddenly become important to us; some may block or inhibit action of anesthetics while others may supplement central or peripheral action of anesthetics upon respiration and circulation. Still other drugs in the hormonal class may lead to fatality if the uninformed administers a standard anesthetic for a minor operative procedure. These are but a few of the reasons why technical skills alone are inadequate for an anesthesiologist.

It is apparent that our specialty is becoming more medically oriented; indeed some departments of Anesthesiology have been organized within the medical rather than the surgical framework of a hospital or medical school. Pharmacologists, clinical investigators and internists are joining us as parts of a team for care and study, while surgeons undertake heroic procedures upon patients who formerly would have been denied operation. In the foreseeable future more daring undertakings both in Anesthesiology and Surgery are predictable.

The additional year of training proposed by the Board should not be just another year of clinical experience nor should it be a year of isolated laboratory or investigational work. We intend that a three year program will offer

a minimum of twenty-four months of experience in the administration of anesthetics and that the entire program will be integrated and progressive so that each resident will have received a specific yet liberal education in all phases of the specialty. We do not intend to train teachers or investigators within this period, but we do believe that the end-product will be a competent anesthesiologist. We realize that the cost of expanded programs will present problems but this should not be a primary deterrent to progress.

It is our firm belief that if two years of training were necessary in 1940 that by 1960 at least three years will be required to inculcate a physician with the same adequacy. In this the Council has concurred since it suggested in 1955 that the period of special training in Anesthesiology after internship be three years.

The challenge of problems in Anesthesiology must be met. Resolute leadership is needed now and in the immediate future to develop patterns of education inclusive enough to guarantee adequate training of future anesthesiologists.

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## Statistics and Biometrics in Anesthesia

PROGRESS in Anesthesiology during the past three decades has been gratifying. Reports of innumerable investigations have appeared in the literature, some of which employed statistical analysis and biometry. Both of the latter are now accepted tools. However, the survey by Dunn<sup>1</sup> of 200 medicophysiology manuscripts revealed that in over 90 per cent of them, statistical methods were necessary and not employed, and well over half of the papers should not have been published because of lack of statistical treatment of data. Many recent articles pertaining to anesthesia revealed that authors are unfamiliar with the use of statistical analysis and biometry in their investigations. This is not conducive to progress.

Opportunities for experimentation in anesthesiology under precise experimental design are countless. Such precision is not available

in many other clinical sciences. Accordingly both clinical and laboratory researchers should be aware of the importance of experimental design, of interpretation of results and of the need for consultation with a statistician. Such consultation should be sought prior to investigation because valid interpretation of results will be dependent upon the design of the experiment.

Knowledge of experimental design and interpretation is of equal importance to the clinical anesthesiologist. Anesthesiologists, the world over, are "bombarded" by numerous reports which extoll the virtues of drugs, methods, and apparatus. To avoid an uncompromising rejection or a trusting acceptance of such claims, one must adopt criteria to enable him to make a sound, reasonable and critical evaluation of the data he has before him. An