Comments Regarding Further Study of Graduate Training in Neurosurgery*

EDITHE J. LEVIT, M.D.
Secretary and Associate Director, National Board of Medical Examiners

I am deeply honored to be here today at the invitation of your Program Committee. It is a real pleasure to participate in the study initiated by the American Board of Neurosurgery, and just described by Dr. Furlow. This may well represent one of the most important studies of graduate medical education in recent times.

As this program proceeds, it is hoped that the impartial and reliable data derived from the in-training examinations may serve to fulfill the primary objectives set forth by the Commission: to provide direction for learning, leading to improvement in the competence of candidates for Board certification, and also to provide a means for the objective evaluation of individual training programs. There is no need for me to comment further on Dr. Furlow's excellent presentation. Rather, at this point, I should like to present for your consideration a view of some additional potentials of this unique program.

The study group to date may be defined as the 648 individuals who have participated in at least one written examination during the past 3 years. For this study group, a vast collection of data accumulated over the years will provide the basis for a significant longitudinal study of graduate education in the field of neurosurgery. Such a continuing study would be directed toward two separate but interrelated objectives: the evaluation of individual performance, and the evaluation of the educational process itself.

Study of Individual Performance

Let us consider the four important sets of available data and then the relevance of these data to certain basic questions inherent in the study of individual performance.

(1) Scores on Written In-Training Examination. To date, nearly 1,000 examinations have been taken by 648 individuals. Since each total test score is comprised of five separate subscores in the several basic and clinical sciences relevant to the discipline of neurosurgery, nearly 6,000 scores have been derived from these examinations.

(2) Scores on Oral Examination. In addition to these data, total scores and subscores on the oral examination of the Board are available thus far for approximately 120 people in the study group, and presumably such data will eventually be available for almost all of them.

(3) National Board and ECFMG Scores. For many of the individuals tested, a measurement at the prereidency level is also available. For those U.S. and Canadian graduates who are National Board candidates, the National Board can provide scores on the basic sciences (Part I, at the end of the second year of medical school), on the clinical sciences (Part II, at the end of the fourth year of medical school), and on Part III, evaluation of clinical competence near the completion of the internship. For the more than 100 graduates of foreign medical schools included in this study, scores on the ECFMG examination which they were required to take before entering residency training are available.

(4) Career Activities Data. In addition, this study may well include objective and comprehensive career activities data, to be obtained as these men progress beyond the Board's qualifying examination and into practice and academic activities.

It becomes readily apparent that analysis and correlation of these multiple measurements of performance, obtained throughout

* Discussion following Dr. Leonard T. Furlow's Report of the Study Commission of the American Board of Neurological Surgery, at the meeting of the American Association of Neurological Surgeons (Harvey Cushing Society) San Francisco, California, April 17, 1967.
the educational life cycle of the neurosurgeon, will provide an opportunity to identify those measures of individual performance at various levels which have value as predictors of subsequent performance.

National Board vs. Written In-Training Examination. To what extent does performance on National Board examinations (taken prior to residency training) predict subsequent performance on the written in-training examination in neurosurgery?

Such a correlation study was performed between scores on the written examination of the specialty boards of Internal Medicine, Surgery, and Pediatrics and the respective Part II discipline scores for the same individuals at the end of the fourth year of medical school. For the groups studied, the correlations indicated a rather substantial relationship between National Board Part II scores at the end of medical school and scores on the written examinations of these three specialty boards. This finding supports the theory that a common element may be found in the measurement of the physician’s performance at different educational levels. Thus, a measure of performance obtained during the fourth year in medical school may serve as a predictor of subsequent performance some 5 years later.

Written In-Training Examination vs. Oral Examination. Another important aspect of the study involves the determination of the relationship between performance on the written in-training examination and the oral certifying examination. The American Board of Neurosurgery is in a unique position to conduct such a study of its oral examination. For most specialty boards, a written examination serves as a screen, or first hurdle, which the candidate must pass before he becomes eligible for the final oral examination. Since other specialty boards admit to the oral examination only those candidates who have successfully passed the written examination, these boards never have the opportunity to see how those who fail on the written might have done on the oral examination. However, in the neurosurgery program eligibility for the oral examination has not been dependent upon performance on the written examination, and there is an opportunity to determine the correlation between these two independently-obtained measures.

It is nonetheless necessary to recognize that oral examination scores must be accumulated over the next year or two before such a correlation can provide statistically significant information. Although 114 individuals in the study group have taken both the written and oral examination, this group does not constitute a representative sample for purposes of a correlation between these two measures. Because of the 2-year interval required between completion of residency and eligibility for the oral examination, almost all of these 114 individuals had already completed residency at the time they took the written examination. Since the written examination was required only for residents in training, those who had already completed training took the written examination on a voluntary basis. Thus, for this group, the bias of self-selection (or motivation) has been introduced. Before a reliable measure can be obtained, oral scores will have to be compared with the written scores of those people who, as residents in training, were required to take the written examination.

As already noted by Dr. Furlow, the same bias of self-selection (or motivation) precludes any definitive study at this time as to the effectiveness of the written examination as a guide to learning. As more data accumulate, and as motivational differences can be controlled, this question will indeed merit further investigation.

Examination Scores vs. Career Activities. One of the most important and perhaps most challenging aspects of this study will be the validation of both the written and the oral examination against ultimate performance in neurosurgery. Dr. Furlow has already discussed a pilot study which was done to determine the relationship between performance on the oral examination and subsequent career activities. Although the questionnaire responses were not sufficient to eliminate the likelihood of bias by self-selection, the results would suggest a positive relationship between these two measurements.

Further, more extensive data about career activities may be obtained from objective sources such as professional society records, the Directory of Medical Specialists, and the
AMA Directory. Such data, carefully collected over the next several years for the entire study group or for a representative sample thereof, and added to all of the other data already available, would provide the means for meeting the first objective of this longitudinal study, namely, the determination of those measures of individual performance at various levels that have predictive value with respect to ultimate performance in the field of neurosurgery.

Study of the Educational Process

As this longitudinal study of individual performance continues, it will become possible to analyze these data according to certain variables within the educational process itself, and to study these variables with respect to the multiple measures of performance already noted. We have already begun to identify each of the individuals in the study group according to medical school and year of graduation, hospital and type of internship, place of neurosurgical training (with or without prior year of general surgery residency), and date of completion of residency training.

These variables, or combinations thereof, may then be analyzed with relation to the performance of various groups on the examinations. Thus, it will be possible to compare the performance of all U.S. and Canadian graduates with that of all foreign medical graduates, to compare those who had straight surgical internships with those who had other types of internship, to compare those who had 1 year of general surgery residency with those who did not, and so forth. Since some of the variables are undoubtedly interrelated, it will be necessary to control for certain differences in order to study the effect of others.

Another important aspect in the study of the educational process involves the classification of programs according to patterns of training, such as the curriculum and time schedule to the residency years, in order to identify those patterns which seem to be related to the highest level of subsequent performance. Thus, as the ongoing program proceeds, and as the primary objectives set forth by the Commission are being met, these data will provide the basis for a significant longitudinal study of both the product and the process of graduate education in neurosurgery.

In closing, I would like to acknowledge with thanks the kind remarks of Dr. Furlow concerning the role of the National Board of Medical Examiners. We are privileged indeed to participate in this fascinating study. But, whatever our contribution, it could not have been accomplished without the superb efforts of the members of the test committee, the imaginative direction and support afforded us by Drs. Guy Odom and Donald Matson, the cooperation of all of the Program Directors, and, most particularly, the continued guidance and wisdom of the Chairman of the Commission, Dr. Leonard Furlow.