# Differential Performance on Subtests of the Educational Council for Foreign Medical Graduates Examination

THE EDUCATIONAL COUNCIL for Foreign Medical Graduates (ECFMG) examination contains 360 questions selected from parts 1 and 2 of the examination of the National Board of Medical Examiners. The questions represent five areas of medicine in approximately the following proportions (data obtained from Dr. A. C. McGuinness, associate director, ECFMG): general medicine, 30 percent; surgery, 20 percent; obstetrics-gynecology, 20 percent; pediatrics, 20 percent; and basic science, 10 percent. Each area, which we refer to as a subtest, is scored separately and then combined into a summary score. A candidate can score less than 75 in some subtests and yet score higher than 75—the passing grade—on the total examination.

Although only 10 percent of the examination consists of basic science questions, failing the examination is often attributed to insufficient knowledge of basic science. For example, of 850 foreign medical graduates who took the examination in the United States on January 24, 1973, and who responded to an interview carried out during the following weeks, 46 percent considered basic science the most difficult part of the examination, but only 12 percent thought that general medicine was the most difficult part. However, an analysis of the subtest scores of foreign medical graduates who took that examination seemed to contradict the perception of basic science as being most difficult. Before we present the results of the analysis, it is necessary to point out some serious methodological difficulties.

The classification of questions into one of the five areas is not always clear because some areas overlap. In addition, the number of questions for some subtests, such as basic science with about 36 questions, is so small that the reliability and validity of the scores are questionable. In fact, the National Board of Medical Examiners (NBME) has suggested—and the ECFMG has agreed—that subtest scores no longer be recorded by the ECFMG. Thus, we do not present detailed results in this paper; rather, we concentrate on those results which contradict the impression that basic science is the most difficult part of the examination for foreign medical graduates.

A total of 4,035 foreign medical graduates took the ECFMG in January 1973, and more than 97 percent, 3,935, responded to a brief written questionnaire administered at the time of the examination (*1*). The subtest scores upon which the analysis is based were obtained directly from the ECFMG for all 3,935 respondents.

An unweighted analysis of variance of the subtest scores by country of medical school (countries were clustered into 10 categories (*1*)) showed significant differences ($P < .001$) among the subtest scores and among the countries. Also, the "interaction" between subtest and country was significant ($P < .001$), that is, the difference in subtest scores varied from country to country. For 7 of the 10 country categories, the aver-

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age basic science score was highest; for the remaining 3 it was second after obstetrics-gynecology. (Only the candidates from India scored significantly higher on obstetrics-gynecology than on basic science: $P < .05$.) The scores for basic science were significantly higher, by the paired $t$ test, than the scores for general medicine, surgery, or pediatrics for candidates from all countries but one—basic science versus pediatrics for Central American candidates, $P = .2$. The differences between the scores for basic science and obstetrics-gynecology were not as large but still significant for candidates from Cuba, Mexico, the Middle East, South America, and Europe.

Although the average differences between the subtest scores were statistically significant, they were not large—usually less than 3 points. The differences in the distribution, however, can be substantial. For example, the following comparison of basic science scores with those for general medicine for the entire sample shows that 34 percent scored 75 or higher in basic science while only 22 percent scored this high in general medicine ($P < .001$).

| *Basic science score* | *General medicine score* | | | |
|---|---|---|---|---|
| | *Less than 75* | *75 or higher* | *Total* | |
| | | | *Number* | *Percent* |
| Less than 75 | 2,327 | 253 | 2,580 | 65.6 |
| 75 or higher | 762 | 593 | 1,355 | 34.4 |
| Total | 3,089 | 846 | 3,935 | 100.0 |
| Percent of total | 78.5 | 21.5 | 100.0 | ---- |

Because questions on general medicine form the largest part of the ECFMG examination, the total scores are largely determined by the general medicine scores, as shown in the following table; nevertheless, 174 candidates (4.4 percent) scored higher than 75 in general medicine but did not pass the examination.

| *Overall score* | *General medicine score* | | | |
|---|---|---|---|---|
| | *Less than 75* | *75 or higher* | *Total* | |
| | | | *Number* | *Percent* |
| Less than 75 | 2,940 | 174 | 3,114 | 79.1 |
| 75 or higher | 149 | 672 | 821 | 20.9 |
| Total | 3,089 | 846 | 3,935 | 100.0 |
| Percent of total | 78.5 | 21.5 | 100.0 | ---- |

Part of the discrepancy between the perception by the foreign medical graduates of the relative difficulty of subtests and the actual subtest results may be due to different definitions of medicine and basic science. Questions dealing with the scientific basis of medical diagnosis are classified by NBME as medicine but may be interpreted by the foreign medical graduate as basic science. This situation may well relate to the major emphasis on pathophysiology as the fundamental tool in the problem-solving aspect of medical diagnosis and care in the United States. The section on medicine attempts to test medical thinking rather than pure rote memory.

We submit that further research on this issue would be useful in assessing foreign medical education and may suggest approaches to supplementing the education of foreign medical graduates who wish to enter the U.S. health system.

*Reference*

1. Weiss, R. J., Kleinman, J. C., and Brandt, U. C.: Foreign medical graduates and the medical underground. N Engl J Med 290: 1408–1413, June 20, 1974.