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Jefferson evaluations: Preclinical

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JEFFERSON EVALUATIONS

PRECLINICAL

CURRICULAR REFORM MAY IMPROVE STUDENTS' PERFORMANCE ON EXTERNALLY ADMINISTERED COMPREHENSIVE EXAMINATIONS

Ivan Damjanov, Bruce A. Fenderson, Mohammadreza Hojat, Emanuel Rubin

Aim: To determine whether changes in the format of teaching pathology and the introduction of active learning principles can improve medical students' performance on external examinations and enhance clinical skills.

Method: The sophomore Pathology Course at Jefferson Medical College (JMC) in Philadelphia, Pennsylvania, U.S.A., was completely restructured in 1986, with greater emphasis placed on independent study, small group teaching, and case study discussion. We used the scores of JMC medical students on the National Board of Medical Examiners (NBME) Part 1 Examination to compare the performance of JMC students who completed their medical education before curricular change (entering classes 1982-1984) with the performance of subsequent generations of students who were taught according to the reformed curriculum (entering classes 1985-1988).

Results: The two groups of students were comparable in terms of standard social and psychometric parameters, such as mean age at matriculation, female/male ratio, ratio of minority students in the class, premedical college grade point averages, and mean scores on the preadmission Medical College Admissions Test. JMC students who studied pathology prior to the curricular reform received on the pathology subsection of the NBME Part 1 Examination reform scores that were close to the national average. In contrast, mean scores for students who studied pathology after curricular changes were significantly higher than the national average ($P < 0.001$). Based on their pathology subscores, the number of JMC students scoring below the cutoff line for passing (380 points) decreased significantly after the curricular reform, whereas the number of high-scoring students whose scores ranked them in the 90th percentile nationally increased. Curricular reform was also associated with an increase in overall student satisfaction.

Conclusion: Curricular changes that include an emphasis on active learning can improve the performance of medical students on externally administered, objective examinations. We have shown that the means of the medical school class can be improved, the number of failing students reduced, and the number of high-scoring students increased. The improvement of students' scores was not limited to the first class after curricular reform, but persisted throughout the entire observation period of four years.

Pathology Education. 2005; 46(3): 443-448.

AN EMPIRICAL STUDY OF THE PREDICTIVE VALIDITY OF NUMBER GRADES IN MEDICAL SCHOOL USING 3 DECADES OF LONGITUDINAL DATA: IMPLICATIONS FOR A GRADING SYSTEM

Joseph S. Gonnella, James B. Erdmann, Mohammadreza Hojat

Context: It is important to establish the predictive validity of medical school grades. The strength of predictive validity and the ability to identify at-risk students in medical schools depend upon assessment systems such as number grades, pass/fair (P/F) or honors/pass/fail (H/P/F) systems.

Objective: This study was designed to examine the predictive validity of number grades in medical school, and to determine whether any important information is lost in a shift from number to P/F and H/P/F grading systems.

Subjects: The participants in this prospective, longitudinal study were 6,656 medical students who studied at Jefferson Medical College over 3 decades. They were grouped into 10 deciles based on their number grades in Year 1 of medical school.

Methods: Participants were compared on academic accomplishments in Years 2 and 3 of medical school, medical school class rank, delayed graduation and attrition, performance on medical licensing examinations and clinical competence ratings in the first postgraduate year.

Results: Results supported the short- and long-term predictive validity of the number grades. Ratings of clinical competence beyond medical school were predicted by number grades in medical school. We demonstrated that small differences in number grades are statistically meaningful, and that important information for identifying students in need of remedial education is lost when students who narrowly meet faculty's expectations are included with the rest of the class in a broad 'pass' category.

Conclusions: The findings refute the argument that knowledge of sciences basic to medicine is not critical to subsequent performance in medical school and beyond if an appropriate evaluation system is used. Furthermore, the results of this study raise questions about abandoning number grades in favour of a pass/fail system. Consideration of these findings in policy decisions regarding assessment system of medical students is recommended.

Medical Education. 2004; 38(4): 425-434.

Available online at publisher's site:

<http://www.ingentaconnect.com/content/bsc/meded/2004/00000038/00000004/art00013>

**THE FATE OF MEDICAL STUDENTS WITH DIFFERENT LEVELS
OF KNOWLEDGE: ARE THE BASIC MEDICAL SCIENCES RELEVANT
TO PHYSICIAN COMPETENCE?**

Mohammadreza Hojat, Joseph S. Gonnella, James B. Erdmann, J. Jon Veloski

Purpose: This study was designed to test the hypothesis that an early gap in knowledge of sciences basic to medicine could have a sustained negative effect throughout medical school and beyond.

Method: A longitudinal prospective study of 4,437 students who entered Jefferson Medical College between 1972 and 1991 was conducted in which the students were divided into three groups. Group 1 consisted of 392 who failed at least one of the three basic sciences courses in the first year of medical school. Group II was comprised of 398 who did not fail but had low first-year grade point averages; and 3,647 of the remaining sample were included in Group III. The groups were compared on retention and dismissal rates, medical school assessment measures, scores on medical licensing examinations, ratings of clinical competency in residency, board certification rates, and faculty appointments.

Results: Significant differences were observed among the three groups confirming the hypothesis that students' level knowledge in sciences basic to medicine early in medical school could predict later performance during medical school and beyond. Implications for early diagnosis of academic deficiencies, for better preparation of medical students, and for the assessment of clinical competency are discussed.

Advances in Health Sciences Education. 1996; 1: 179-196.

Available online at publisher's site:

<http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1007/BF00162915>

SOONER OR LATER? USMLE STEP 1 PERFORMANCE AND TEST ADMINISTRATION DATE AT THE END OF THE SECOND YEAR

Charles A. Pohl, Mary R. Robeson, Mohammadreza Hojat, Susan L. Rattner, J. Jon Veloski

Purpose: To determine whether the elapsed time between completion of the second-year curriculum and test date alters a student's outcome on USMLE Step 1.

Methods: Total scores for 601 students who completed Step 1 in 1999-2001 were classified into six, one-week time periods between June 1 and mid-July depending on test date. Analysis of variance and covariance was used to explore differences across time with adjustment for previous academic performance.

Results: Mean weekly scores decreased from a high of 221 in early June to a low of 208 in July. However, analysis of covariance confirmed that differences across time were not significant ($p < .30$). Weekly differences were explained by predicted performance based on gender, MCAT science and medical school test scores.

Conclusions: Performance on Step 1 is unaffected by the time interval between completing the curriculum and taking the examination within the first two months after completing the pre-clinical curriculum.

Academic Medicine. 2002; 77: S17-S-19.

Available online at publisher's site:

<http://www.academicmedicine.org/pt/re/acmed/pdfhandler.00001888-200210001-00006.pdf>

**USING RATINGS OF RESIDENT COMPETENCE TO EVALUATE NBME
PASSING STANDARDS**

Barbara J. Turner, Mohammadreza Hojat, Joseph S. Gonnella

The passing standards of the NBME examinations were empirically evaluated by analyzing the distribution of scores received by 1,994 graduates of one medical school and the clinical competence ratings given the graduates by their first-year residency directors. A significant association was found between NBME scores and postgraduate ratings in the cognitive areas of clinical competence. Graduates scoring 420 or less on NBME Part I or II received significantly lower medical knowledge ratings than did the total group of graduates. A similar analysis of NBME Part III scores was less clear-cut but also suggested a score of 420 or less could identify those graduates at significant risk of receiving lower knowledge ratings. Using low cognitive ratings as an outcome measure, NBME Part II was not sensitive in detecting such graduates. Based on these data, changes in passing standards could not be proposed, but rather the authors recommended that these standards continue to be reassessed and further measures be taken to strengthen the internal evaluation methods in medical schools.

Journal of Medical Education. 1987; 62(7): 572-581.