Title : PRETESTS: PREDICTORS OF FINAL EXAMINATION PERFORMANCE?

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Introduction. Continuing comparisons of pretest scores to final examination performance validated our earlier contention[1] that cognitive gain of anesthesia residents can be demonstrated. Furthermore, the total pretest remained a predictor of student placement in the upper and lower half of the class on the final examination (p=.05). It occurred to us that our pretest and final examinations were testing at least two subsets of knowledge: A body of general medical knowledge (G) that is particularly pertinent to anesthesiologists and a body of anesthesiology-specific knowledge (A). We believed a definition and evaluation of these subsets might increase the predictive power of our pretest and more precisely define student deficits and gains.

Methods. (1) Definition of G and A: Semester coordinators individually categorized G and A components for the pretest and individual semester examinations. This made it possible to examine 3 semesters of final examination scores as a single test as well as analyze the G and A subsets.

(2) Evaluation of the predictive power of the pretest: A correlation matrix of examination scores was calculated (Pearson r) for all possible subsets. The matrix initially compared 12 variables and was eventually expanded to consider combinations of the more statistically interesting components.

Results. The original categorization of coordinators differed only 3%. Negotiation reduced this to less than 1%. Alpha (α) coefficients for all subsets except the A component of the pretest ranged from .61-.81 and S.E.s from 2.0-4.0, further supporting the validity of categorization. The G/A ratio of the total pretest was 1/1.3 and for all 3 semester examinations, 1/1.1. While the G/A ratio was approximately 1/1 overall, it varies with content area (CNS ≃ 1/3, PULMONARY ≃ 2/1, CARDIOVASCULAR ≃ 1/1). In the table below, it is important to note that, although the total pretest is a good predictor of total final examination, Pretest G predicts better. Moreover, Pretest G is also a much better predictor of total Final Examinations A. Pretest A does not predict any of the variables.

TABLE
CORRELATION COEFFICIENTS
QN = question number

QN	Test	Final Exams (total) 225	Final Exams G (total) 123	Final Exams A (total) 133
80	Total Pretest α =.76	.72 p=.015	.65 p=.03	.72 p=.014
35	Pretest G α =.72	.78 p=.006	.73 p=.01	.77 p=.008
45	Pretest A α =.37	.56 p=.06	.48 p=.09	.61 p=.04

Discussion. That Pretest A was a poor predictor was not surprising to us. This is compatible with the fact that most students are naive regarding A prior to residency training. Pretest A scores are also lower, more variable and therefore compatible with low alpha (.37). While overall cognitive gain is demonstrable, student numbers do not yet permit statistically valid statements concerning the specificity (G or A) of deficits, gains or loss.

The predictive value of Pretest G was a more startling finding; particularly in regard to predicting Final Examinations A. These findings have led us to speculate whether Pretest G scores simply identify better, and perhaps more motivated, students, or whether differences in scores might be a kind of barometer which reflects definable differences in basic medical knowledge that are essential for didactic success in residency training. If the latter case prevails, it might be possible to identify efficiently and to remediate systematically our deficient students as well as to improve the progress of the better students.

Reference.

1. Rhoton, F, et al: Abstr, 1978 ASA Ann Meeting.