

Title: ELIMINATION OF UNNECESSARY LABORATORY TESTS BY PREOPERATIVE QUESTIONNAIRE

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Introduction. Surgical patients routinely undergo numerous preoperative blood tests. To eliminate unnecessary tests without sacrificing quality of care, one study retrospectively determined which indications for a test were most accurate in predicting surgically significant abnormalities.¹ Based on this information, we devised two questionnaires (one for patients, and one for their surgeons) that search for these indications. We then prospectively studied patient and physician responses to determine cost savings and how well these questionnaires selected tests that subsequently had abnormal results.

Methods. We obtained institutional approval and patient consent and participation from 160 patients scheduled to have vascular, ENT, or general surgery. Based on indications reported in the literature to predict surgically significant abnormalities, two questionnaires were devised. Each patient answered one questionnaire (the patient questionnaire) and their surgeon, or the surgeon's secretary or nurse, answered the other questionnaire (M.D. questionnaire). The routine screening battery of tests (which differ according to service involved) was performed. Based on the responses to the questionnaires, we determined which tests were indicated. If a questionnaire was lost or not completed, all screening tests were assumed to be indicated (thus diminishing the cost savings that would occur). We then recorded every test result that was abnormal and whether the abnormality was potentially significant to surgical course or outcome. To determine limits for potentially surgically significant values, we used suggestions from the literature¹ and clinical experience. We then determined the percentage and dollar savings of ordering preoperative tests based on responses to each questionnaire, and the percentage and number of unindicated tests that produced results that might be surgically significant. An abnormality on any individual test (e.g., glucose) in a test panel (e.g., SMA 12) was considered to make the result for the entire test panel abnormal.

Results. Very few abnormal results were produced by tests not indicated by answers to the M.D. questionnaire (table 1); only three potentially surgically significant abnormalities were produced by tests not indicated by answers to the patient questionnaires (table 2). Chart review indicated that none of these abnormalities were surgically significant. Use of these questionnaires would produce savings of \$68 in charges per patient, excluding the savings of avoiding repeat tests, consultations, postponed surgery, and so forth.

Discussion. The questionnaires appear able to indicate which laboratory tests would have the vast majority of abnormal results. The consequences of missing abnormalities that might have been revealed by tests consist of medicolegal liability and

potential patient harm. The former must be weighed against the liability incurred when abnormalities revealed by tests are not acted upon, or even noted, as is common now. The latter requires a bigger sample than we now have but appears small if present findings continue. Selectively ordering preoperative laboratory tests might decrease resource expenditure with little impact on patient care.

References. 1. Kaplan EB, Boeckmann AS, Roizen MF, Sheiner LB: Elimination of unnecessary preoperative laboratory tests. *Anesthesiology* 57:4445, 1982

TABLE 1. RESULTS FROM M.D. QUESTIONNAIRE

Test	No. of Tests Examined	% Not Indicated by Questionnaire	No. of Abnormal Test Results	No. of Abnormal Results Not Indicated by Questionnaire
PT	135	88%	0	0
PTT	134	89%	1	0
PLT	132	90%	5	1*
Hgb and WCB	158	35%	24	0
DIFF	150	75%	29	0
SMA6	142	22%	39	1**
SMA12	141	22%	55	1***
UA	157	84%	26	1*
RPR	149	89%	1	1*

*see discussion under appropriate test in Table 2
**creatinine of 1.9 mg/dL
***LDH was 156 U/L; normal is less than 149U/L

TABLE 2. RESULTS FROM PATIENT QUESTIONNAIRE

Test	No. of Tests Examined	% not Indicated by Questionnaire	No. Indicated that Weren't Obtained	No. of Abnormal Test Results	No. of Abnormal Results Not Indicated by Questionnaire
PT	135	64%	7	0	0
PTT	134	65%	7	1	0
PLT	132	82%	6	5	1*
Hgb and WBC	158	46%	0	24	0
DIFF	150	83%	0	29	0
SMA6	142	23%	3	39	0
SMA12	141	18%	5	55	0
UA	157	87%	0	26	1**
RPR	149	92%	0	1	1***

*PLT count was 113,000/mm³, no perioperative action taken
**UA revealed greater than 50 WBC's/HPF in patient who complained of frequent nocturia
***RPR was abnormal in past in this patient