# Practical Mental Health Assessment in Primary Care

## Validity and Utility of the Quick PsychoDiagnostics Panel

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■ BACKGROUND Many case-finding instruments are available to help primary care physicians (PCPs) diagnose depression, but they are not widely used. Physicians often consider these instruments too time consuming or feel they do not provide sufficient diagnostic information. Our study examined the validity and utility of the Quick PsychoDiagnostics (QPD) Panel, an automated mental health test designed to meet the special needs of PCPs. The test screens for 9 common psychiatric disorders and requires no physician time to administer or score.

■ METHODS We evaluated criterion validity relative to the Structured Clinical Interview for DSM-IV (SCID), and evaluated convergent validity by correlating QPD Panel scores with established mental health measures. Sensitivity to change was examined by readministering the test to patients pretreatment and posttreatment. Utility was evaluated through physician and patient satisfaction surveys.

■ RESULTS For major depression, sensitivity and specificity were 81% and 96%, respectively. For other disorders, sensitivities ranged from 69% to 98%, and specificities ranged from 90% to 97%. The depression severity score correlated highly with the Beck, Hamilton, Zung, and CES-D depression scales, and the anxiety score correlated highly with the Spielberger State-Trait Anxiety Inventory and the anxiety subscale of the Symptom Checklist 90 (*P*s <.001). The test was sensitive to change. All PCPs agreed or strongly agreed that the QPD Panel "is convenient and easy to use," "can be used immediately by any physician," and "helps provide better patient care." Patients also rated the test favorably.

■ CONCLUSIONS The QPD Panel is a valid mental health assessment tool that can diagnose a range of common psychiatric disorders and is practical for routine use in primary care.

■ KEY WORDS Mental health; primary health care; depression; psychological testing; psychiatry; psychological assessment. *(J Fam Pract 2000; 49: 614-621)*

Approximately 60% of patients with diagnosable psychiatric disorders seek care from primary care physicians (PCPs) rather than mental health professionals; primary care has been called the de facto mental health services system in the United States.[1] Unfortunately, PCPs often underdiagnose and undertreat mental disorders. Research indicates that mental disorders are present in at least 20% of medical outpatients,[2] and 50% to 65% of these cases go undetected.[3-11] Numerous case-finding tools are available to help PCPs diagnose depression, the most common mental disorder. A recent and comprehensive review of depression case-finding instruments[12] showed that all are comparable in their ability to detect depression, with an average sensitivity of 84% and average specificity of 72%. However, many PCPs find these instruments too cumbersome and time consuming for routine use,[3,13] and none has gained widespread adoption in primary care. The authors of that comprehensive review concluded that "selection of a particular instrument should depend on issues such as feasibility, administration and scoring times, and the instruments' ability to serve additional purposes, such as monitoring severity or response to therapy."

Interviews and focus groups with PCPs echoed these conclusions,[14] indicating that factors other than validity are often overlooked by investigators and pose obstacles to physician acceptance and implementation. Physicians emphasized the time constraints of primary care practice and noted that mental health case-finding instruments took time to administer and score, had the potential to disrupt office routines and patient flow, and created paperwork. Another reason for dissatisfaction was that many instruments provided only numeric scores, not

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specific psychiatric diagnoses that could better inform treatment decisions. Finally, physicians questioned the utility of instruments that screened for depression only and did not assess other psychiatric disorders that often coexist with depression and have implications for treatment (eg, anxiety disorders, addictive disorders). One instrument that is designed to diagnose multiple disorders, the Primary Care Evaluation of Mental Disorders (PRIME-MD),[15] requires physicians to conduct patient interviews that last an average of 8.4 minutes and can run to 15 minutes or more, and is therefore impractical in many primary care settings.*

This article describes a new mental health assessment tool, the Quick PsychoDiagnostics (QPD) Panel, designed to meet the need for a practical and time-efficient psychiatric assessment tool for primary care. Our 3 study goals were to establish the validity of the test, evaluate the utility of the test for assessing treatment outcomes, and assess both patient and physician acceptance of the test in busy primary care settings.

## METHODS

### Description of the QPD Panel

The QPD Panel is a fully automated test that requires no time from physicians to administer or score. Patients self-administer the test in 6.2 minutes on average, using specially designed hand-held computer units. The hand-held units are approximately the size of a textbook and have large liquid crystal display (LCD) screens and "True" and "False" response buttons. Patients read diagnostic questions on the screen and answer by pressing the response buttons (all questions use a True/False response format). When a patient completes the test, the hand-held unit is placed on a docking station connected to a printer, and a diagnostic report is printed immediately. The computer-generated report resembles a familiar laboratory blood chemistry report (Figure 1). Patient data are also stored electronically, and the database can be accessed for subsequent analysis (eg, to create aggregate reports for the patient population).

The QPD Panel screens for 9 mental disorders based on *Diagnostic and Statistical Manual of Mental Disorders, fourth edition* (*DSM-IV*)[17] diagnostic criteria: major depression, dysthymic disorder, bipolar disorder, generalized anxiety disorder, panic disorder, obsessive-compulsive disorder (OCD), bulimia nervosa, alcohol or substance abuse, and somatization disorder. The report provides numeric scores indicating the severity of symptoms, a specific psychiatric diagnosis, and a list of the symptoms leading to the diagnosis (when applicable). The test also identifies patients who may be at risk for suicide. In the sample report (Figure 1) the depression severity score is outside the normal reference range, indicating clinically significant symptoms, and a note indicates a diagnosis of major depression. The last section of the report lists the specific symptoms reported by the patient that led to this diagnosis.

The QPD Panel has been used in a variety of ways in primary care clinics. In some facilities, all patients are given the QPD Panel when they check in with the receptionist, and they complete the test in the waiting room. The report is then put in the patient's chart and is available to the physician

FIGURE 1

**QPD Panel (Quick PsychoDiagnostics Panel)**

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| | | | |
|---|---|---|---|
| Physician: | Dr Joel Fleischman | | |
| Patient: | Smith, John | Sex: | M |
| Ref No: | 123456789 | Age: | 42 |
| Date: | 7/1/00 | | |

Diagnostic Report

| Test | Results within range | Results out of range | Reference Range |
|---|---|---|---|
| Depression | | 19 | 0-10 |
| Anxiety | 8 | | 0-10 |
| Panic Disorder | 5 | | 0-8 |
| OCD | 0 | | 0-3 |
| Bulimia | 0 | | 0-4 |
| Alcohol/Substance Abuse | 1 | | 0-3 |
| Somatization | 6 | | 0-11 |

Note: Symptoms consistent with Major Depressive Episode

Depressive Symptoms

— depressed mood nearly every day, 2 weeks or longer duration
— diminished interest or pleasure in activities, 2 weeks or longer duration
— appetite loss
— weight loss
— insomnia
— fatigue, lack of energy
— feelings of worthlessness or guilt
— impaired concentration

*A self-report version of PRIME-MD that substitutes a questionnaire for the interview has recently been developed,[16] but the instrument still appears too cumbersome for routine use.

before examining the patient. In other facilities, physicians administer the QPD Panel at their discretion, when they suspect a psychiatric disorder. In those facilities, physicians ask patients to complete the QPD Panel after conducting an initial examination. While the patient answers the questions the physician goes on to examine other patients, then returns to review the QPD Panel results.

The test begins with the following instructions, displayed on the LCD screen:

> Your doctor is interested in both your physical and emotional health. This questionnaire will ask about physical and emotional problems you may be having. Your answers will help your doctor give you the best medical care possible.
>
> You will see a series of statements. If a statement applies to you, press the button labeled True. If a statement does not apply to you, press the button labeled False.
>
> Your answers are confidential, between you and your doctor, so please answer as honestly as you can. Most people finish this questionnaire in 5 to 10 minutes.

The instructions are followed by a series of diagnostic questions. The test incorporates branching and logic, so all patients do not see the same questions. Instead, questions are selected for presentation on the basis of the answers to previous questions. Thus, healthy patients are not asked irrelevant questions, and patients who may have mental disorders are examined in-depth.

### Test Design

The test combines features of an inventory and a structured interview. All patients respond to a core set of 59 questions (like an inventory); when responses suggest a possible psychiatric disorder the test branches into modules that probe in-depth (like a structured interview). The test contains more than 200 diagnostic questions, but a patient will see only a subset of them. Scoring is done electronically. Numeric scores reflecting the severity of disorders are created by summing the number of relevant test items (symptoms) endorsed by the patient. The test does not use cut-points to make specific psychiatric diagnoses (ie, categorical diagnoses like major depressive disorder, dysthymic disorder, or OCD). Instead, pattern-matching algorithms match symptoms reported by the patient against *DSM-IV* diagnostic criteria, and printed notes on the report (not numeric scores) indicate the specific *DSM-IV* diagnosis. Diagnosis of alcohol or substance abuse is an exception, with positive findings based on a cut-point taken on the alcohol/substance abuse numeric score.

Reliabilities (coefficient $\alpha$)[18] of the numeric severity scores range from .78 to .95, indicating that the scores are relatively free of measurement error. In addition to meeting appropriate psychometric requirements, all items included in the QPD Panel met strict criteria with respect to patient acceptance: (1) the items required no more than a grade school reading level; (2) patients rated the items as clear and easy to understand; (3) patients rated the items as appropriate for primary care (ie, they were not perceived as inappropriate or overly intrusive); and (4) patients could respond to the items without assistance. Overall readability of the test is at grade level 5.0, as assessed by the Flesch-Kincaid Grade Level score, which is based on the average number of syllables per word and words per sentence. The test construction methods have been described in greater detail elsewhere.[14]

### Validity Studies: Overview of Design

We report the results of 3 studies that address the validity of the QPD Panel. The first study examined validity for the psychiatric diagnoses (categorical diagnoses) of major depression, generalized anxiety disorder, panic disorder, and OCD. Diagnoses provided by the Structured Clinical Interview for *DSM-IV* (SCID),[19] widely regarded as a diagnostic gold standard, served as criterion standards. The second study examined the validity of the QPD Panel alcohol/substance abuse scale by evaluating the scale's ability to differentiate known abusers from healthy control patients. The third study reports convergent validity correlations between selected QPD Panel severity scores and established measures. Table 1 provides an overview of the 3 studies. Additional information about study methodology is presented in the following section.

## RESULTS

### Validity Studies

***Mood and Anxiety Disorders.*** The research subjects were 203 health maintenance organization (HMO) patients referred by their physicians or self-referred for a first-time mental health consultation. None were receiving mental health treatment at the time of the study. Patients scheduled for first-time mental health consultations were recruited by telephone during the week before the consultation and were paid $25 for participation. Approximately 60% of those contacted agreed to participate. One patient who appeared to have a psychotic disorder was excluded from the sample. The sample was two thirds women, with a mean age of 41.39 years (standard deviation [SD]=11.69). The subjects completed an assessment protocol that included the QPD Panel, relevant modules of the SCID structured psychiatric interview, and the Hamilton Depression Inventory.[20] Administration order was randomized. SCID diagnostic interviews were conducted by mental health

TABLE 1

**Summary of Validation Studies for the Quick PsychoDiagnostics Panel**

| Study Goal | Sample Characteristics N | Mean Age | % Women | Further Details | Measures Used |
|---|---|---|---|---|---|
| Criterion validation of mood and anxiety disorder modules | 203 | 41 | 66 | HMO patients referred for first-time mental health consultation | Independent SCID diagnosis |
| Criterion validation of alcohol/substance abuse modules | 159 | 42 | 71 | 46 alcohol/substance abuse patients referred to chemical dependency clinic; 113 primary care controls | Ability to discriminate known alcohol or substance abusers from control patients |
| Convergent validation of depression and anxiety severity scores | 131-203 | 31-41 | 44-78 | Three independent samples (primary care, mental health, and community samples) | Beck Depression, Hamilton Depression, Zung Depression, CES-D, Spielberger STAI, SCL-90 anxiety subscale |

HMO denotes health maintenance organization; SCID, Structured Clinical Interview for *DSM-IV*; CES-D, Center for Epidemiological Studies Depression scale; STAI, State Trait Anxiety Inventory; SCL-90, symptom checklist 90.

professionals with master's or doctorate degrees who were trained in the administration of the SCID and blind with respect to all other study data.

Table 2 shows indexes of agreement between QPD Panel diagnoses and SCID structured interview diagnoses. The first 2 columns report sensitivity (proportion of patients with a positive SCID diagnosis correctly identified by the QPD Panel) and specificity (proportion of patients without a SCID diagnosis correctly identified by the QPD Panel). Sensitivity was good to excellent for all diagnoses, ranging from 69% (for OCD) to 81% (for major depression). Specificities were uniformly high, ranging from 90% to 97%, indicating that the test seldom made false-positive diagnoses (ie, diagnoses not confirmed by the SCID). The third column of Table 2 reports κ coefficients, which provide an index of agreement between the QPD and SCID diagnoses, correcting for agreement due to chance.[21] The κ coefficients were good to excellent for all diagnoses, ranging from a low of .64 for OCD to a high of .79 for major depression.* The last 2 columns of Table 2 list the prevalence rates for each diagnosis, as determined by the QPD Panel and by the SCID. Prevalence rates were comparable for both instruments, suggesting that neither instrument had a systematic tendency to overdiagnose or underdiagnose any disorder.

*The OCD module has been revised, and we anticipate higher validity coefficients for OCD in future studies.

***Alcohol and Substance Abuse.*** The QPD Panel includes a 14-item alcohol/substance abuse scale. All patients answer 5 of the questions; the remaining questions are presented only when previous responses suggest abuse. The numeric alcohol/substance abuse score is derived by summing true responses to the scale items, so the scale has a possible range of 0 to 14. The goals of this study were to evaluate the diagnostic accuracy of the scale and establish the optimal cut-point for making a diagnosis. The study evaluated the QPD Panel's ability to distinguish between patients known to suffer from alcohol or substance abuse and healthy control patients.

The research subjects were 159 patients enrolled in an HMO health plan; 70.8% were women, with a mean age of 41.9 years (SD=12.25). Forty-six of the patients had received a definitive diagnosis of alcohol or substance abuse by their physicians or by a mental health professional and had been referred to a chemical dependency clinic for treatment (chemical dependency sample); they completed the QPD Panel as part of the chemical dependency clinic intake procedure. The remaining 113 patients were control patients who completed the QPD Panel during routine primary care

TABLE 2

**Indexes of Agreement Between Quick PsychoDiagnostics Panel Diagnoses and SCID Diagnoses (n=203)**

| Diagnosis | Sensitivity | Specificity | κ | Prevalence, % QPD | Prevalence, % SCID |
|---|---|---|---|---|---|
| Major depression | .81 | .96 | .79 | 30.0 | 34.2 |
| Generalized anxiety disorder | .79 | .90 | .67 | 26.4 | 23.9 |
| Panic disorder | .71 | .97 | .72 | 12.4 | 13.5 |
| Obsessive-compulsive disorder | .69 | .97 | .64 | 8.3 | 7.6 |

QPD denotes Quick PsychoDiagnostics Panel; SCID, Structured Clinical Interview for *DSM-IV*.

office appointments (control sample).

Table 3 reports the sensitivity, specificity, and κ coefficients obtained using 4 scale cut-points. The first row presents the validity coefficients when a scale score of 1 or higher was treated as a positive diagnosis; the second row presents the validity coefficients when a scale score of 2 or higher was treated as a positive diagnosis; and so on. The scale achieved maximum diagnostic accuracy when a score of 2 or higher was treated as a positive diagnosis (Table 3, row in boldface), with a resulting sensitivity of 98% and specificity of 92%.

***Convergent Validity.*** To establish convergent validity, we examined correlations between selected QPD Panel severity scales (numeric scores) and established, well-validated measures. Correlations were obtained in a variety of patient and community samples, with sample numbers ranging from 113 to 215.* The QPD Panel depression scale correlated highly with the Beck Depression Inventory[22] (BDI, $r$=.80); the Hamilton Depression Inventory[20] ($r$=.87); the Center for Epidemiological Studies Depression (CES-D) Scale[23] ($r$=.79); and the Zung Self-Rating Depression Scale[24] ($r$=.78). The QPD Panel anxiety scale correlated highly with the Spielberger State-Trait Anxiety Inventory[25] ($r$=.67) and the anxiety subscale of the Symptom Checklist-90 (SCL-90)[26] ($r$=.76). The QPD Panel somatization scale correlated highly with the somatization subscale of the Symptom Checklist 28 (SCL-28), $r$=.59. All correlations are statistically significant ($P$s <.001) and near the upper limits allowed by the respective scale reliabilities, indicating strong convergent validity.

TABLE 3

**Validity Indexes for the Quick PsychoDiagnostics Panel Alcohol/Substance Module (n=159)**

| Number of Items Answered True | Sensitivity | Specificity | κ |
|---|---|---|---|
| ≥ 1 | 1.00 | .83 | .74 |
| ≥ 2 | .98 | .92 | .86 |
| ≥ 3 | .78 | .96 | .76 |
| ≥ 4 | .76 | .96 | .76 |

*The correlation involving the Hamilton Depression Inventory was obtained in a sample of 203 mental health patients, 66% women, with a mean age of 41.39 years (SD=11.69); the correlation involving the Zung Self-Rating Depression Scale was obtained in a sample of 113 primary care patients, 77.9% women, with a mean age of 41 years (SD=12.69); the correlation involving the SCL-28 somatization scale was obtained in a sample of 215 primary care patients, 77.6% women, with a mean age of 48.8 years (SD=15.6). Other correlations were obtained in a sample of 131 community volunteers, 44% women, with a mean age of 30.52 (SD=12.87).

## Utility

### *Sensitivity to Change*

An important issue bearing on the utility of a mental health assessment instrument is its ability to monitor response to treatment. To evaluate the utility of the QPD Panel depression and anxiety scales for treatment monitoring, we studied a sample of depressed patients longitudinally.[27] The research participants were 113 HMO patients identified by their PCPs during routine primary care office visits as suffering from depressive disorders. The sample was 77.9% women, with a mean age of 41 years (SD=12.69). To establish baseline depression scores, participants were administered the QPD Panel and the Zung Self-Rating Depression Scale at the time of their initial medical office visit (pretreatment). They were then treated for depression with antidepressant medication, brief psychotherapy, or both. The QPD Panel and the Zung depression scale were readministered at 4 and 12 weeks after initiation of treatment.

Figure 2 shows changes in the QPD Panel depression and anxiety scores from pretreatment through 12 weeks after initiation of treatment. The mean QPD Panel Depression score was 14.8 (SD=5.64) at baseline, 11.2 (SD=6.7) at 4 weeks post-

treatment, and 7.7 (SD=6.6) at 12 weeks posttreatment, representing a change from baseline of approximately 50%, or somewhat more than 1 standard deviation, in the anticipated direction. Changes in the QPD Panel scores were paralleled by changes in Zung depression scores, which also declined by slightly more than 1 standard deviation during the same interval. Additionally, QPD and Zung depression scores were highly correlated at every assessment point (*r*s from .62 at baseline to .84 at 12 weeks post-treatment). The findings indicate that the QPD Panel is useful for treatment monitoring as well as initial screening.

### *Physician Acceptance*

Table 4 presents findings from a physician satisfaction survey conducted to formally evaluate the utility of the QPD Panel in a busy primary care setting. Data were provided by a sample of 26 primary care providers (physicians and nurse practitioners) practicing at one of 2 outpatient medical facilities in a large group model HMO in the Denver area. Physicians in these clinics see approximately 20 to 24 patients per day, with appointments scheduled at 15- to 20-minute intervals. Physicians who participated in the study used the QPD Panel on a routine basis for 1 month or longer. No incentives were given to the medical facilities or the physicians to use the QPD Panel or participate in the satisfaction study. Physicians rated each statement listed in Table 4 using a 5-point rating scale (1=strongly disagree; 5=strongly agree). Means for the physician satisfaction items were uniformly high and near the scale maximum of 5.0. As another way of presenting the data, the last column of Table 4 lists the percentage of clinicians who agreed or strongly agreed with each survey statement. The data demonstrate the high physician acceptance achieved by the QPD Panel.

### *Patient Satisfaction*

PCPs sometimes express the concern that patients will object to mental health screening or regard the screening questions as inappropriate or intrusive. To evaluate this possibility, we asked a sample of 77 HMO patients who had completed the QPD panel to respond to 4 survey questions using an agree or disagree response format. Of these, 97% agreed with the statement "the questionnaire was easy to use"; 99% agreed "the questions were clear and easy to understand"; 96% agreed "the questionnaire asks about things that are important for my doctor to know"; and 96% *disagreed* that "The questions were too personal and made me feel uncomfortable."

## DISCUSSION

Although many health care experts agree that there is a need for improved mental health screening in primary care, mental health case-finding tools are not widely used in primary care settings. Previous studies have generally focused on the validity of case-finding instruments, but factors other than validity pose obstacles to implementation. Many physicians are also concerned about the time required to administer and score the instruments, their potential for disrupting office routines, the paperwork they create, whether they provide specific psychiatric diagnoses, and whether they can detect mental disorders other than depression.

Specificity of case-finding instruments is also a concern. A review of depression case-finding instruments reported an average specificity of 72%;[12]

FIGURE 2

**Quick PsychoDiagnostics Panel Depression and Anxiety Scores, Pretreatment and Posttreatment**

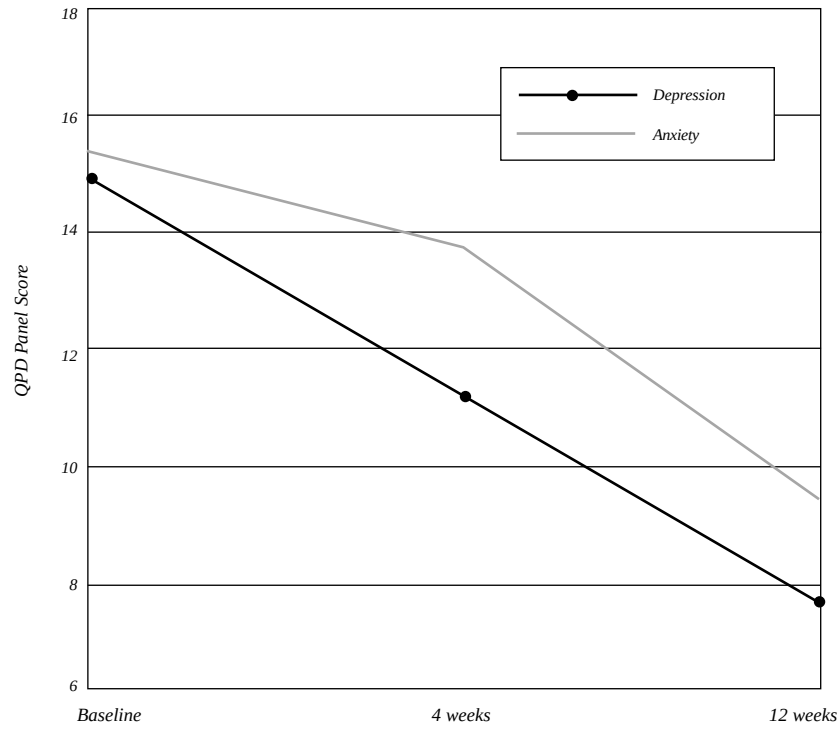

TABLE 4

**Means for Physician Satisfaction Questionnaire (N=26)**

| Item | Mean* (SD) | % Agree or Strongly Agree |
|---|---|---|
| The QPD Panel is convenient and easy to use. | 4.8 (.40) | 100 |
| The QPD Panel integrates easily into the primary care clinic. | 4.6 (.90) | 89 |
| The QPD Panel presents results in a clear easy-to-understand format. | 4.8 (.51) | 96 |
| The QPD Panel is well accepted by patients. | 4.6 (.50) | 100 |
| The QPD Panel helps me provide better patient care. | 4.7 (.60) | 100 |
| The QPD Panel can be used immediately by any physician, without special training required. | 4.6 (.75) | 100 |

*On a scale of 1-5, where 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, and 5=strongly agree.
QPD Panel denotes Quick PsychoDiagnostics Panel; SD, standard deviation.

another recent review advocated a 2-question screening test but reported a specificity of only 57%.[28] It is important to recognize that a screening or case-finding instrument with a specificity of 72% will incorrectly identify as depressed 28 out of every 100 patients who are not depressed, and a test with a specificity of 57% will incorrectly identify 43. These false-positives are costly in terms of physician time and make case-finding instruments less attractive to busy practitioners.

The QPD Panel may have greater utility in primary care settings than other mental health tests because it automates diagnostic procedures that would otherwise be performed by physicians and medical support staff. The use of hand-held computer units and diagnostic algorithms allows the test to screen for multiple disorders and make specific psychiatric diagnoses, while requiring no time from physicians or staff to administer or score. Use of a familiar laboratory report format allows quick and easy interpretation of test findings by nonpsychiatric physicians. Diagnostic performance appears as good as or better than that of other recently developed instruments. Because diagnostic specificity is high for all disorders, false-positives are rare. Finally, the QPD Panel is well accepted by primary care patients. Concerns that patients may object to the test appear unfounded.

### Limitations

The criterion validity study has several limitations. We used a mental health sample, so prevalences of psychiatric disorders were higher than would be observed in a primary care sample. Future studies should be undertaken to replicate the findings in primary care samples. Also, the study did not provide validity coefficients for dysthymic disorder or bulimia nervosa because of low prevalence rates in the study sample. The diagnostic modules for these disorders have high face validity, and test development followed the same procedures used for the validated modules. However, validation against a criterion standard must await further research. Finally, we made no attempt to validate the diagnosis of bipolar disorder against a criterion standard. We believe a bipolar diagnosis should be made by a mental health professional with detailed knowledge of the patient's history. Thus, the QPD Panel is designed to screen for possible bipolar disorder but not make actual diagnoses.

## CONCLUSIONS

In light of its validity and its practicality in primary care settings, the QPD Panel may make routine mental health screening feasible for many more physicians. Such routine screening would benefit the many patients who currently go undiagnosed and untreated.

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