A DIAGNOSTIC AID FOR DETECTING MULTIPLE MENTAL DISORDERS IN PRIMARY CARE: THE SYMPTOM DRIVEN DIAGNOSTIC SYSTEM FOR PRIMARY CARE (SDDS-PC®).

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A high rate of undiagnosed mental disorders in primary care has been well documented for nearly three decades. (Shepherd et al 1966; Regier et al 1978, 1993; Goldberg et al 1980; Van Hermert et al 1993; Olfson and Klerman, 1992; Barrett el al 1988). Failure to recognize mental illness has been shown to lead to undertreatment, greater impairment, and a longer duration of illness (Ormel et al 1991). The few efforts to change the diagnostic practice of primary care physicians, either through providing information from a patient screen completed prior to the physician visit or through physician education, have provided equivocal results. (Higgins 1994; Rand et al 1988; Goldberg 1980). The effects of improved physician recognition on decreasing patients' health care use have also been equivocal, probably because there are many steps between recognition and patient outcome. These steps include accurate diagnosis, proper treatment, patient compliance, and timely follow-up with adjustment in treatment, as needed.

Efforts to improve detection of mental disorders have concentrated on developing patient screens, which usually include a list of psychiatric symptoms independent of specific diagnoses, (Goldberg et al 1980; Borgquist et al 1993; Von Korff et al 1987) or which screen for one diagnosis; depression or alcoholism (Selzer 1971; Babor et al 1992). The former approach is limited because symptoms are not directly related to a treatable disorder, the latter, because patients may have more than one treatable psychiatric disorder (Kessler et al 1994). Moreover, screens are not widely used in primary care (Nelson and Berwick, 1989). Because most primary care visits are 15 minutes long or less, there is a need to develop rapid assessment methods that can be incorporated into routine care (Barrett 1991; Mitchell et al 1988; Anderson and Mattsson 1989).

The diagnostic process for mental disorders, however, does not end with the results of a patient-completed screen. There is a need for the next stage, an interactive process with the patient to follow-up the positive screen results, clarify symptoms, confirm the diagnosis, and decide what action to take.

The Symptom-Driven Diagnostic System for Primary Care (SDDS-PC®) (The Upjohn Co, Kalamazoo, Mich) was developed in an attempt to fill the gaps in methods of detecting and diagnosing mental disorders in primary care. The three sequential components of the SDDS-PC® are the screening questionnaire, the diagnostic module interviews, and the longitudinal tracking form (Figure 1). They are used together to assist the primary care physician in making an appropriate diagnosis and evaluating ongoing treatment. The system adapts structured diagnostic interviewing to primary care. These methods are commonly used in psychiatric research and have more recently been used in clinical psychiatric settings (Klerman 1990).

The patient self-administered screening instrument was developed and tested for six diagnoses seen in primary care--major depression (MDD), generalized anxiety disorder (GAD), panic disorder, obsessive-compulsive disorder (OCD), and alcohol and drug abuse and dependence--as well as for detection of suicidal ideation or attempts (see Broadhead et al 1995) for a complete description of the screen results). Second, brief structured diagnostic interviews were developed with patients who screened positive for these disorders. The purpose of the first-stage screen is to separate out normal from potentially abnormal cases rather than to establish a diagnosis (comparable to a mammography). The purpose of the diagnostic modules is to follow-up the potentially abnormal cases to clarify the symptoms,

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make a diagnosis, and determine the next steps (if any) to management (comparable to a biopsy). Finally, a longitudinal tracking form was developed to follow patients symptoms and impairment over subsequent visits.

Although structured diagnostic interviewing methods have a long history in psychiatry (Klerman 1990), with the exception of a recently reported project by Spitzer and colleagues (Spitzer et al 1994) to our knowledge this is the first time that these methods have been adapted for primary care. This chapter reviews the initial testing of the screen and physician administered diagnostic interviews portion (the diagnostic modules) in two separate studies. Then we describe new developments in the SDDS-PC® system. These include a computerized nurse, rather than physician, administered interview tested in a third study, and a computerized assisted telephone interview (CATI) under testing. Both were developed to meet the constraints on physicians time in primary care.

The SDDS-PC® Screening Questionnaire

The SDDS-PC® screening questionnaire originally consisted of 62 items and was later reduced to 54 items in the second study with 16 core items used in scoring. The screening questionnaire is self-administered by the patient in the waiting room prior to the medical visit. Results are entered into a personal computer by a health care worker and automatically scored. The computer administration speeds processing of the clinical information, but limits the utility of the system to practices with access to a personal computer. In addition to the screening symptoms, three impairment questions are completed by the patient which address the patient's overall state of mental health, work impairment, and social functioning.

Six types of mental disorders commonly seen in primary care - major depression, panic disorder, alcohol and drug abuse and dependence, generalized anxiety disorder (GAD), and obsessive compulsive disorder (OCD) - along with suicidal ideation, are simultaneously screened.

The screening component of the SDDS-PC® has been investigated through three separate research studies. The first, a preliminary validation study, screened 937 primary care patients in a Rhode Island family practice (Broadhead et al 1995). Of these, 388 patients received a diagnostic interview, the SCID-P (Structured Clinical Interview for the DSM-III-R, version P (Williams et al 1992; Spitzer et al 1992), administered by a mental health professional who was blind to the SDDS-PC® results. Table 1 shows the sensitivity (the proportion of all patients with a disorder who are correctly identified by the screen), specificity (the proportion of all patients without a disorder who are correctly identified by the screen), positive predictive value (the proportion of all patients who screen positive that have the disorder), and the negative predictive value (the proportion of all patients who screen negative that do not have the disorder) for each of the six scales. The low PPVs for GAD and OCD may limit the general utility of these screens in unselected primary care samples.

In the first study, patients also received a standard screen for depression: the 8-item Medical Outcomes Study (MOS) brief depression screener (Burnam et al 1988). The results of the study indicate that the operating characteristics of the four item SDDS-PC® depression screen (sensitivity=90, specificity=77, PPV=40, NPV=98) are comparable with the eight item MOS screener (sensitivity=79, specificity=90, PPV=51, NPV=97) at the

recommended cutscore. These findings lend criterion-related validity to the SDDS-PC®
depression screen. Table 2 shows that as compared with patients who screened negative,
those who screened positive for at least one SDDS-PC® disorder had a significantly greater
likelihood of reporting occupational impairment, marital distress, and fair or poor overall
emotional health.

The second study, a cross-validation, involved 775 primary care patients in Rhode
Island and South Carolina family practices, 257 of whom received the SCID-P. Independent
replication in this sample shows attenuated but acceptable operating characteristics for most
of the scales (Table 3). Because screen items were selected for optimal operating
characteristics in the first study, some decrease in screen performance was to be expected
during the cross-validation study.

A third screen validation study (to be described) using DSM-IV criteria and involving
1,001 primary care patients has been recently completed at Kaiser Permanente in Oakland,
California.

The SDDS-PC® Diagnostic Modules

The diagnostic process does not end with the results of a patient-completed screen.
Physicians must then establish an interactive communication with their patients to clarify the
implications of the symptoms reported on the SDDS-PC® screen. To help facilitate this
process, brief structured diagnostic interviews,(diagnostic modules) were developed for use
with patients screening positive on the SDDS-PC® screening questionnaire scales.

The diagnostic modules were developed to be administered by a primary care
physician, but clinical experience has shown that other health care professionals can

administer the modules as well. The modules used in this study are based on the American Psychiatric Association Diagnostic and Statistical Manual, third edition, revised (DSM-III-R) criteria (American Psychiatric Association 1987). Each interview is completed in less than 5 minutes and includes questions to determine the presence and duration of symptoms as well as the algorithms for DSM-III-R criteria. Each module also provides relevant information about related subsyndromal conditions and common general medical disorders which may mimic the mental disorder in question.

Based on the clinical data gathered during the module interview, the physician makes a clinical judgment as to the diagnosis. While it is possible to accept the diagnosis based solely on the criteria evaluation, the physician has wide latitude in accepting or rejecting criteria based diagnoses. It is recommended that clinical judgment, medical considerations, and knowledge of the individual patient be factored into the diagnostic process, with the module serving as an aid in developing a final diagnosis.

The diagnostic modules were pilot tested concurrently in the sample used for the SDDS-PC® screen cross-validation study (Weissman et al 1995; Olfson et al 1995). Of the 775 patients completing the screen, 246 received at least one physician-administered diagnostic module and 158 received at least one diagnostic module and the independent SCID-P interview.

Most of the diagnostic modules exhibited acceptable agreement with the results of the structured diagnostic interview (Table 4). However, the operating characteristics varied across specific diagnoses. The low prevalence of GAD in the study sample may have limited the PPV for this scale. Similarly, the sensitivities and PPVs for alcohol abuse and

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dependence and OCD were incalculable or unacceptable, perhaps in part because of low sample prevalence.

One possible source of disagreement between the SDDS-PC® module diagnoses and the SCID-P diagnoses is that in interpreting module data, physicians may have incorporated considerations of non-psychiatric causes of the patient's psychiatric symptoms. On the other hand, some physicians may have failed to rule out medical sources of the patient's psychiatric symptoms which were subsequently uncovered on the SCID-P interview.

Following the second study, a survey of the participating physicians was conducted to evaluate their experience with the modules. The diagnostic modules were reported to be useful by 15 of the 16 participating primary care physicians. Thirteen of the physicians stated that the modules helped them to become aware of at least one previously unrecognized psychiatric problem in their practice. Four of the physicians thought that the interviews were too time-consuming.

Physician diagnoses of a mental disorder were highly correlated with patient impairment ratings. As compared to patients who did not receive a module diagnosis, patients who received a module diagnosis missed work or school more frequently during the past month because of an emotional problem (40% versus 15%); were not getting along well with their partner (27% versus 13%); and rated themselves as in fair or poor emotional health (47% versus 24%); The association between independent patient impairment ratings and module-derived mental disorder diagnoses supports the criterion validity of the diagnostic modules.

The identification of mental disorders with diagnostic modules was also strongly associated with mental health care intervention reported by the physicians on a physician

action form at the time of the index medical visit. More than three quarters (82%) of the patients who received a module diagnosis (N=76) received some mental health intervention from their primary care physician. In contrast, only about one-third (36%) of the module negative patients (N=146) received such an intervention. The mental health interventions provided by primary care physicians to module positive patients were usually verbal interventions, such as listening to problems (65%), giving advice (53%), or counseling the patient (40%), but sometimes included the prescription of a psychotropic medication (33%) or referral to a mental health professional (21%).

The SDDS-PC® Longitudinal Tracking Form

A longitudinal patient tracking system has been developed and is being pilot tested. The longitudinal tracking form charts the symptoms of patients who meet diagnostic criteria as well as patients with subsyndromal conditions who fail to meet full diagnostic criteria but nonetheless warrant clinical monitoring.

The tracking form is a computer-generated one-page symptom and impairment summary which is placed in the patient chart prior to each successive medical visit. It provides the physician with a current description of the patient's symptoms, an historical overview of how the symptom pattern has changed over time, and a clinical global improvement scale. Such information may prove valuable in the ongoing process of reassessment and treatment readjustment which characterizes high quality clinical care.

Study 3: Nurse Administered Diagnostic Interviews

Further development and testing of the SDDS-PC® screen and diagnostic modules has been recently completed on a sample 1,001 patients, ages 18 to 70 years at Kaiser Permanente, Oakland, California, a large prepaid group practice (Leon et al submitted;

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Weissman et al submitted; Hoven et al in preparation). For this study, the modules were modified to accommodate the time concern expressed by some of the physicians in the second study. The wording, layout, and presentation of the diagnostic modules was made more efficient. Module questions were also updated to DSM-IV (American Psychiatric Association 1994). In this study, the modules were administered by registered nurses and then computer scored. The information was given to physician on a one-page summary form listing positive symptoms and computer generated provisional diagnosis based on the interview data. The physicians then used this information and the responses to each question to making the final diagnosis.

The design, in brief, was as follows: Patients completed the screening form, a nurse administered structured diagnostic interviews, an assessment by their primary care physician, and a structured diagnostic interview administered over the telephone by a mental health professional.

The SDDS-PC® screening form achieved acceptable operating characteristics with respect to the nurse administered structured diagnostic interview for each of the six disorders (sensitivity: 50.0 to 88.5; specificity: 82.1 to 99.6; positive predictive value: 14.7 to 60.0; and negative predictive value: 94.5 to 99.4)(Leon et al submitted). These findings compare favorably with several commonly used medical screening tests.

The nurse administered diagnostic interviews also demonstrated acceptable agreement with the physician diagnoses and with the structured telephone interview diagnoses. Patients who scored positive on the SDDS-PC® reported significantly poorer emotional health and were significantly more likely to report occupational impairment and marital distress than

patients who scored negative. Many of the patients diagnosed by the physicians with the aid of the SDDS-PC® reported never having been previously told by a physician that they had an emotional problem or an addictive disorder. This third study provides additional evidence to support the diagnostic accuracy and clinical utility of the DSM-IV SDDS-PC® in primary care practice. Research is currently being planned to examine the effects of the DSM-IV SDDS-PC, including its longitudinal tracking form on critical patient outcomes and to study the administration of the SDDS-PC® via computerized automated telephone interviewing.

Computer Assisted Telephone Interview (CATI)

SDDS-PC® is currently available in three formats: pen/paper patient self-report for batch entry, computer-based clinical interview, and computer-assisted telephone interview (CATI). The pen/paper and computer-based direct entry systems require a certain level of resource commitment in personnel and technology that not all health care providers may have. A CATI application was developed to provide access to the SDDS-PC® system to those providers who lack either sufficient computer capability or staff to assist patients in filling out forms, or who have unique requirements that make other applications impractical.

The CATI system allows on-site or off-site (including the patient's home) screening and diagnostic interviewing to occur using a touch-tone telephone. The results are stored on a centrally located computer. Based on screening responses, diagnostic interviews are administered and all results are sent via facsimile directly to the physician.

This approach to using SDDS-PC® in a primary care environment overcomes the prevalent limitations inherent to a computer-based system. However, there are additional considerations regarding a CATI application's usefulness in clinical practice. An initial

useablity study recently completed (Barr and Pleil 1995) indicated that both practitoners and patients found the CATI to be an acceptable approach to diagnostic screening for mental health problems. Further studies, however, are indicated, to evaluate the CATI in different environments and under different conditions.

Conclusion

Growing pressure in the United States and elsewhere to contain health care expenditures and limit access to subspecialty care has focused attention on the provision of mental health services by primary care physicians. The expanding clinical roles of primary care physicians underscore the importance of developing brief and sensitive tests to identify, diagnose, and monitor mental disorders in primary care. The SDDS-PC® is an accessible procedure to diagnose and monitor multiple mental disorders in routine primary care practice.

Criterion-based systems such as the SDDS-PC® have the potential to focus clinical care more sharply on specific mental disorders and thereby improve patient care. As a result, the SDDS-PC® may increase the efficiency with which mental health care is provided in primary care practice. Experimental research is needed to measure the extent to which criterion-based systems such as the SDDS-PC® influence the pattern of health care delivery, the amount of health care expenditure, and, most importantly, the quality of clinical outcomes.

ACKNOWLEDGEMENTS

Agency for Health Care Policy and Research; and Paul Young, M.D., American Board of Family Practice. Their presence on the Advisory Council in no way signifies an endorsement by these individuals or organization.

TRADEMARK

The SDDS-PC™ is a trademark of The Upjohn Company.

FIGURE 1.   THE SDDS-PC™: A DIAGNOSTIC AID FOR MULTIPLE MENTAL DISORDERS IN PRIMARY CARE

| SCREENING QUESTIONNAIRE screens patients according to 6 subscales | → → → → → select appropriate diagnostic modules | 6 POSSIBLE DIAGNOSTIC MODULES conduct selected interview(s) from list below: 1. Major Depression 2. Panic Disorder 3. Alcohol Abuse/Dependence 4. Generalized Anxiety Disorder 5. Obsessive Compulsive Disorder 6. Suicidal Ideation | → → → → → confirm diagnosis | LONGITUDINAL TRACKING FORM use to follow changing patient symptom profile |

from Olfson et al 1995   *full title here*

TABLE 1. Scale Operating Characteristics for the SDDS-PC™ Screen Preliminary Validation Study

SCALE	Sensitivity	Specificity	PPV´	NPV´
Major Depression (N = 61)	90%	77%	40%	98%
Panic Disorder (N = 27)	78%	80%	21%	80%
Alcohol Abuse/Dependence (N = 12)	62%	98%	54%	99%
Generalized Anxiety Disorder (N = 12)	90%	54%	5%	99%
Obsessive Compulsive Disorder (N = 8)	65%	73%	5%	99%
Suicidal Ideation (N = 70)	43%	91%	51%	88%

Operating characteristics data from Broadhead et al, 1995,
˙ PPV = Positive Predictive Value ˙ NPV = Negative Predictive Value, N = Number of patients with this SCID-P diagnosis.

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TABLE 4. **Scale Operating Characteristics for the SDDS-PC™ Diagnostic Interview Modules**

SCALE	Sensitivity	Specificity	PPV*	NPV*
Major Depression (N=47)	57%	86%	80%	72%
Panic Disorder (N=62)	39%	88%	46%	84%
Alcohol Abuse/Dependence (N=8)	—	100%	--	88%
Gen Anxiety Disorder (N=97)	38%	81%	15%	94%
Obsessive Compulsive Dis (N=51)	0%	96%	0%	92%
Suicidal Ideation (N=72)	79%	73%	59%	88%

Data from Weissman et al, 1995. * PPV = Positive Predictive Value * NPV=Negative Predictive Value
N=Number of patients who completed the SCID-P and diagnostic interview module for that diagnosis. Calculations were not completed in empty cells because of the limited sample size.

TABLE 3. *Scale Operating Characteristics for the SDDS-PC™ Screen Cross-Validation Study*

SCALE	Sensitivity	Specificity	PPV*	NPV*
Major Depression (N = 47)	67%	83%	43%	93%
Panic Disorder (N = 16)	65%	84%	20%	98%
Alcohol Abuse/Dependence (N = 10)	38%	99%	60%	97%
Generalized Anxiety Disorder (N = 14)	85%	60%	11%	99%
Obsessive Compulsive Dis (N = 10)	24%	81%	5%	96%
Suicidal Ideation (N = 34)	63%	92%	48%	95%

Data from Broadhead et al, 1995. `*` *PPV = Positive Predictive Value* `*` *NPV = Negative Predictive Value N = Number of patients with this SCID-P diagnosis. Any disorder excludes suicidal ideation.*

full reference

TABLE 2. *Patient Impairment and SDDS-PC™ Screen Status - Preliminary Validation Study*

Impairment Measure	SDDS-PC™ Screen Positive	SDDS-PC™ Screen Negative
Fair or poor emotional health	*39%*** *	*4%*
Missed work or school due to emotional problems (past month)	*16%** *	*4%*
Not getting along with partner	*13%* *	*5%*
Endorsed one or more of above	*48%*** *	*12%*

*N's vary due to absence of a partner and nonresponse from 119 to 137 SDDS-PC™ screen negative cases and 204 to 247 for SDDS-PC™ screen positive cases. *p<0.05, **p<0.0005, ***p<0.0001.*
(Broadhead et al, 1995)

full reference

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