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Cross-Validation of a Screener to Predict Opioid Misuse in Chronic Pain Patients (SOAPP-R)

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Abstract

Objectives—The Screener and Opioid Assessment for Patients with Pain - Revised (SOAPP-R) is a self-report questionnaire designed to predict aberrant medication-related behaviors among persons with chronic pain. This measure was developed to complement current risk assessment practices and to improve a clinician's ability to assess a patient's risk for opioid misuse. The aim of this study was to cross-validate the SOAPP-R with a new sample of chronic, non-cancer pain patients.

Methods—Three hundred and two participants (N=302) prescribed opioids for pain were recruited from five pain management centers in the U.S. Subjects completed a series of self-report measures and were followed for five months. Patients were rated by their treating physician, had a urine toxicology screen, and were classified on the Aberrant Drug Behavior index.

Results—Seventy-three percent (73.2%) of the subjects (N= 221) were followed and 66 participants repeated the SOAPP-R after one week for test-retest reliability. The reliability and predictive validity, as measured by the area under the curve (AUC), were found to be highly significant (test-retest reliability = .91; coefficient α = .86; AUC = .74) and were sufficiently similar to values found with the initial sample. A cut-off score of 18 revealed a sensitivity of .80 and specificity of .52.

Conclusions—Results of this cross-validation study suggest that the psychometric parameters of the SOAPP-R are not based solely on the unique characteristics of the initial validation sample. The SOAPP-R is found to be a reliable and valid screening tool for risk of aberrant drug-related behavior among chronic pain patients.

Keywords

substance abuse; chronic pain; opioids; addiction; aberrant drug behaviors

There has been a growing use of opioids for the treatment of chronic pain, especially for chronic, noncancer pain, and due, in part, to this growth, increasing notice has been given to the abuse of prescription opioid medication^{1, 2}. Opioids can be an effective treatment for chronic pain, yet providers are reluctant to prescribe opioids because of concerns over tolerance, dependence, and addiction. Some pain centers where opioids are prescribed have been overwhelmed with patients seeking pain medication for purposes other than to control their pain or to control their pain in ways not medically prescribed, and many physicians

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prescribing pain medication have little training to deal with addiction or in dealing with aberrant medication-related behavior³. In a survey of primary care physicians, one-third of respondents indicated that they would not, under any circumstance, prescribe opioids to patients with chronic, noncancer pain^{4, 5}. However, seventy percent of these same physicians indicated that this type of pain is usually inadequately treated^{4, 5}. Clinicians continuously identify the need for additional opioid risk management tools and training to objectively assess and monitor chronic pain patients being considered for opioid therapy.

The Screener and Opioid Assessment for Patients with Pain - Revised (SOAPP-R)⁶ was developed to complement current risk assessment practices and to improve a clinician's ability to assess a patient's risk for opioid abuse. The SOAPP-R addresses some of the limitations of the original SOAPP V.1. The SOAPP-R was empirically, rather than conceptually, derived; it was validated in a more systematic fashion and it contains more subtle items and items that do not require admission of socially unacceptable behaviors. The SOAPP-R was found to have good psychometric properties in a test with 284 chronic pain patients on long-term opioid therapy. Classical test development methods require that the primary reliability and validity be confirmed in a cross-validation study⁷. Any validity coefficient computed on a given sample can be spuriously high since such values capitalize on random sampling errors within the particular sample. It is expected that the validity and reliability parameters will "shrink" when tested on a new sample, however, the scale should still remain valid and reliable. Cross-validation reflects a high, but necessary standard for any assessment where the results may impact important clinical decisions.

The purpose of this study was to cross-validate the SOAPP-R with a new sample of chronic, noncancer pain patients.

Methods

Participants

This study's procedures were approved by the Human Subjects Committee of the various participating centers. Chronic, noncancer pain patients were recruited from pain management centers in five states in the U.S. (Massachusetts, New Hampshire, Pennsylvania, Ohio, and Indiana). Patients prescribed opioids for their pain were informed about the study and invited to participate. All subjects signed an informed consent form and were assured that the information obtained through their responses to the questionnaire and from the urine toxicology screens would remain confidential and would not be part of their clinical record. Participant patients were compensated with a \$50 gift certificate for completing the measures.

Patient Completed Measures

The same self-report measures used to evaluate the alpha version items were administered to this cohort of patients (as described in the following sections).

Demographic Questionnaire—Patients answered demographic questions on a self-report form. Questions included gender, age, race/ethnic background, and highest education completed. In addition, they were asked to indicate the location of their pain as well as how long they had been taking opioids.

Screener and Opioid Assessment for Pain Patients--Revised (SOAPP-R)⁶—The SOAPP-R is a revised version of the SOAPP v.1⁸. The revised scale contains 24 items rated from 0="never" to 4="very often" (see Table 1). The SOAPP v.1 was comprised of items that were conceptually derived from expert consensus. The SOAPP-R was empirically derived, tested against a more systematic criterion (the Aberrant Drug Behavior Index (ADBI), see

below), and incorporated items that were more subtle (i.e., less transparent as to what the “right” answer is). All 24 items of the SOAPP-R are summed to create a total score.

The Brief Pain Inventory (BPI)⁹—The BPI is a well-known, self-report, multidimensional pain questionnaire. The BPI provides information about pain history, intensity, and location as well as the degree to which the pain interferes with daily activities, with mood, and how it influences the patient’s enjoyment of life. In addition, the BPI includes a question about how much pain relief the patient has experienced in the past 24 hours due to pain treatments or medication. Scales (rated from 1 to 10) indicate the intensity of pain at its worst, at its least, average pain, and pain “right now.” Test-retest reliability for the BPI reveals correlations of .93 for worst pain, .78 for usual pain, and .59 for pain now. Research suggests that the BPI has adequate validity and has been adopted in many countries for clinical pain assessment, epidemiological studies, and in studies of the effectiveness of pain treatment. Although originally developed to assess cancer pain, the BPI has been validated for use in patients with chronic, noncancer pain¹⁰.

Patient Interview Measure—Self-report of patient status was obtained using the Prescription Drug Use Questionnaire (PDUQ)¹¹. This 42-item interview is an acceptable abuse/misuse assessment screener for pain patients¹². Based on the American Society of Addiction Medicine’s (ASAM) definition of addiction in chronic pain patients, the PDUQ is a 20-minute interview where the patient is asked about his or her pain condition, opioid use patterns, social and family factors, family history of pain and substance abuse syndromes, patient history of substance abuse, and psychiatric history. The PDUQ has been shown to distinguish addicted and non-addicted patients using modified DSM-IV criteria such that subjects scoring below 11 “did not meet criteria for a substance disorder”, and those scoring 15 or greater “had a substance use disorder.” For purposes of this study, patients with a score of 11 or higher on the PDUQ interview were identified as being at risk for a substance disorder. The interview was administered by a trained research assistant (RA) identified at each performance site.

Physician Completed Measure—Each patient’s physician was asked to complete the Prescription Opioid Therapy Questionnaire (POTQ)⁶. This 11-item scale, adapted from the Physician Questionnaire of Aberrant Drug Behavior¹³, was completed by the treating clinician to assess misuse of opioids. The items reflect the behaviors outlined by Chabal and colleagues¹⁴ that were indicative of prescription opioid misuse. The participant patient’s chart was made available to the treating physician to facilitate accurate recall of information. Physicians provided yes or no answers to eleven questions indicative of misuse of opioids, including multiple unsanctioned dose escalations, episodes of lost or stolen prescriptions, frequent unscheduled visits to the pain center or emergency room, excessive phone calls, and inflexibility around treatment options. Patients who were positively rated on two or more of the items met criteria for prescription opioid misuse.

Toxicology Screen—Participating patients were requested to provide a urine sample during their follow-up visit and to inform the staff of their current medications. Patients were informed that information from the toxicology screen would remain confidential and would not be part of their medical record. Each patient was given a specimen cup and instructed to provide a urine sample (~30–75 ml of urine) without supervision in the clinic bathroom. The RA at each center collected and shipped the sample to a central Quest Diagnostics lab (www.questdiagnostics.com). The results of the urine toxicology were sent directly to the research team. The treating physician and the clinic did not have access to the results. The urine samples were tested for the following substances: 6-MAM (heroin), codeine, dihydrocodeine, morphine, oxycodone, oxymorphone, hydrocodone, hydromorphone, meperidine, methadone,

propoxyphene, buprenorphine, fentanyl, tramadol, amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, phencyclidine, and ethyl alcohol.

Aberrant Drug Behavior Index (ADBI)—Patients were classified as to whether they engaged in aberrant medication-related behavior. Aberrant medication use incorporates a variety of behaviors commonly believed to be associated with opioid medication misuse, abuse, and addiction¹⁵. Since there is no ‘gold standard’ for identifying which patients are and which are not abusing their prescription medications¹⁶, we classified patients into categories of aberrant medication-related behavior by triangulating three perspectives; self-report via structured interview, physician report, and urine toxicology results. The ADBI is based on positive scores on 1) the self-reported PDUQ, 2) the physician-reported POTQ, and 3) the urine toxicology results. A positive rating on the PDUQ is an accumulated score higher than 11. A positive rating on the POTQ is given to anyone who has two or more physician-rated aberrant behaviors⁸. A positive rating from the urine screen is given to anyone with evidence of having taken an illicit substance (e.g., cocaine) or an additional opioid medication that was not prescribed. We chose not to count the omission of a prescribed opioid medication from the urine screen results as a positive rating. Eight attending physicians rated a list of behaviors and findings thought to be most reflective of abuse of opioids. Absence of a prescribed drug in the urine was rated lower than other findings and behaviors. The reasons given for this lower rating were lack of sensitivity of the urine toxicology screen to detect certain drugs and the fact that some patients legitimately ran out of their medication just prior to being due for a refill. We also did not classify urines that were rejected by the lab (e.g., insufficient urine or leakage). Urine screen results were confirmed based on chart review of prescription history and a comparison between self-report at the time of the urine screen and the toxicology report. Those with positive scores on the PDUQ were given a positive ADBI. If this score was negative, then positive scores on both the urine toxicology screen and on the POTQ (≥ 2) contributed to a positive ADBI. This allowed for triangulation of data to identify those patients who admitted to aberrant medication-related behavior and those who underreported aberrant behavior (e.g., low PDUQ scores, but positive POTQ and abnormal urine screen results). For those patients who did not have results of urine toxicology screens, ADBI classification was based on results from the PDUQ and POTQ.

Procedures

The 24-item version of the SOAPP-R was administered to chronic pain patients who had not participated in the original validation study¹⁷. Participants were recruited from pain centers in Boston, MA; Toledo, OH; Allentown, PA; Indianapolis, IN; and Lebanon, NH. All procedures for the cross-validation were identical to those used in the validation stage⁶. Participants were administered the demographic form, BPI, and SOAPP-R items upon signing consent. They were followed for five months and then were asked to complete the PDUQ, BPI, and to offer a urine sample for toxicology screening.

Statistical analyses

Data were analyzed with SPSS (Statistical Package for the Social Sciences; Chicago, IL) v. 16.0.1. Relations among demographic data, interview items, and questionnaire data were analyzed using IntraClass correlations, computations of coefficient alpha, and receiver operating characteristic (ROC) curve analysis, as appropriate. ROC curve analyses were used to assess the sensitivity and specificity of the SOAPP-R as a screening tool for the detection of aberrant medication-related behavior. Comparisons of ROC curves of the initial and cross-validation samples were made using MedCalc® v.9.5.2.0.

Results

Participants

A cross-validation sample of 302 patients who were taking long-term opioid medication for chronic noncancer pain participated in this stage of the study (Table 2). The average age of the patients was 51.3 years (SD = 13.2; range 22-83 years), 50% were women, 79.8% Caucasian, and 59.6%^{*} reported low back pain as their primary pain site. Eight-two patients were selected to complete the SOAPP-R one-week later for a retest and 66 (80%) successfully returned the completed questionnaire. Average age for these patients was 50.3 years (SD = 12.6; range 25-77 years), 68.8% were women, 64.1% were Caucasian, and 48.5% identified having low back pain. Of the 302 patients, 221 (73%) were successfully followed and provided enough data to establish the predictive criterion (the ADBI score). Similar to the original validation sample, those who could not be followed did not differ from completers with respect to gender, marital status, and education level. Also similar to the original sample, there was a significant difference for age (mean completer age = 52.6, SD = 13.5; mean non-completer age = 47.4, SD = 11.9, $t = 2.27$, $df = 30$, $p < 0.01$). Unlike the original sample, completers and non-completers were not different with respect to minority status. The mean score on the SOAPP-R for all the subjects was 20.5 (SD = 10.7; range 1 to 62).

Cross-Validation of SOAPP-R Reliability

Cross-validation revealed good replication of the reliability statistics of the SOAPP-R. Test-retest reliability over a one-week period yielded an ICC of .91 (95% CI: .86 to .94). Internal consistency for the cross-validation was also excellent with a coefficient α of .86. These values compare well with those obtained on the original sample (test-retest ICC = .92, coefficient α = .88) suggesting that the SOAPP-R has stable reliability parameters.

Cross-Validation of Predictive Validity

As in the original validation, the predictive validity test evaluated the SOAPP-R in relation to patients' ADBI scores after five months. ROC curve analysis was conducted on the cross-validation sample²⁰, which revealed an AUC of .74 (95% CI: .670 to .810; $p < .001$). Figure 1 presents the ROC curve and Table 3 presents the sensitivity and specificity cutoff estimates for the range of the SOAPP-R. Compared with the ROC on the initial sample (AUC = .81, 95% CI: .748 to .869, $p < .001$)⁶, there was a slight decrease, which is to be expected when a measure is tested in an entirely new population. At a cutoff of 18, the original validation sample revealed sensitivity of .81 and specificity of .68. For the cross-validation sample, sensitivity was .79, although specificity was quite low, at .52. The AUC remains highly significant, suggesting that the predictive validity of the SOAPP-R is significantly greater than chance. Moreover, in the original sample, 34.5% of those who were successfully followed achieved a positive score on the SOAPP-R using a cutoff of 18. In the cross-validation sample, the corresponding proportion of patients was 33.5%. Finally, we directly compared the ROC curves of the initial and cross-validation samples. AUCs of these curves were not significantly different ($z = 1.497$, $p = .13$)²¹.

Discussion

The present study reports on an effort to cross-validate the SOAPP-R, a revised version of the initial SOAPP v.1. The SOAPP-R is a self-report measure of risk potential for aberrant medication-related behavior among persons with chronic pain. In an original validation study⁶, the SOAPP-R was found to be a reliable and valid measure. Cross-validation of a scale on

^{*}This rate of back pain is similar to other observations of chronic pain populations^{18, 19}.

a new sample of respondents is a rigorous psychometric step that examines the extent to which psychometric coefficients are stable across samples. Results of the cross-validation effort reported here suggest that the psychometric parameters of the SOAPP-R are not based solely on the unique characteristics of the initial validation sample.

While the SOAPP-R requires additional research, this study suggests that it may be a better screening tool than other measures that are currently used (e.g., the CAGE)²² and that have no empirical base in a chronic pain population. At a minimum, the SOAPP-R can be used to alert the physician to potential risks associated with aberrant medication-related behaviors and to allow him/her to avert situations that may result in serious problems for the patient. Patients' responses to the SOAPP-R questions access information not necessarily obtained during an initial evaluation, especially when a nonspecialist conducts the assessment. Documentation of these responses might prove helpful in a medical/legal context by providing a basis upon which to decide whether to request more frequent office visits, pill counts, urine toxicology screens, or discontinuation of therapy.

The SOAPP-R should be used only with chronic pain patients being considered for long-term opioid therapy. Broad-based administration of the SOAPP-R for all patients with chronic pain would not be appropriate. The SOAPP-R may help the provider determine the level of monitoring appropriate for a particular patient. SOAPP-R scores are based upon the willing and direct responses of patients. While the SOAPP-R contains items for which the "correct" response may not be immediately transparent, patients determined to "look good" on the SOAPP-R will not find it difficult to do so. In our initial clinical work with the SOAPP v.1, we found that many patients are truthful in their responses. Yet, it is critical for providers to consider results obtained from the SOAPP-R in the context of information from other sources, including history and physical examination, the clinical interview, discussions with family members, laboratory findings, and review of medical records.

The SOAPP-R was devised as a self-report measure to predict future aberrant medication-related behavior based on past behavior and/or cognition. We have recently developed a questionnaire to be used periodically for those patients who have been taking opioids for an extended period of time, known as the Current Opioid Misuse Measure (COMM)²³. The intent of this scale is to document current behavior on a periodic basis in order to continue to justify chronic opioid therapy and to help detect potential ongoing difficulties. It is our belief that the SOAPP-R and COMM will work in tandem to help identify problems associated with the use of prescription opioids for pain.

It is important to emphasize the limitations of this study. First, this study was conducted in anesthesia-based pain centers and included a volunteer sample of patients. Also, not all patients gave a urine sample for a toxicology screening. When this occurred, two other sources of patient status were used, but risk of selection bias remains. Continued efforts are needed to validate the SOAPP-R in other settings. Usefulness of the present measure in a primary care clinic with patients with shorter duration of pain particularly needs to be determined. Bayes Theorem²⁴ postulates that the predictive value of diagnostic or laboratory tests is not constant but must change with the proportion of patients who actually have the target disorder among those who undergo the diagnostic evaluation. Thus, it is critical that the SOAPP-R not be used as a general screening tool in primary care practice. Instead, it should only be used with chronic pain patients being considered for starting, restarting, or changes in long-term opioid therapy, regardless of the setting. Furthermore, most of the respondents (~60%) in this sample of patients at chronic pain treatment centers had back pain. The majority of patients treated at pain management centers report back pain to be their chief pain complaint¹⁸. For this crossvalidation study, patients were recruited from five pain centers in five different states. The percentage of patients in this study with low back pain is an accurate reflection of the chronic pain types currently

being treated within the United States 19. More research is warranted on the utility of the SOAPP-R in samples with other types of pain.

Finally, shrinkage of coefficients obtained during the cross-validation of the ROC analyses is acknowledged. AUCs for the cross-validation and original validation samples were on the edge of the 95% CIs for these two analyses, although the curves were not statistically different. Clearly, one cannot accept the null hypothesis. Furthermore, while the sensitivity of the SOAPP-R at a cutoff of 18 was acceptable and comparable to the original validation, specificity was lower than desired in the cross-validation. The obtained lower specificity suggests less than acceptable discrimination if using a more conservative, binary AUC calculation²⁵. This may be too conservative for present purposes, especially since the clinician can use the sensitivity and specific figures presented in Table 3 to determine the balance with which he or she is comfortable. The traditionally calculated AUC of .74 exceeds the rule-of-thumb cutoff for acceptable discrimination (an AUC of at least 0.70; 26). Furthermore, it should be noted that shrinkage of the AUC was anticipated, as cross validation is a stringent test of validity that is often neglected.

In the present context, the sensitivity of a screening tool may be more important than its specificity, as it may be most critical to ensure identification of those who later show evidence of problems with their medications. Lower specificity means that some patients will be mislabeled as having problems managing their medications when that may not actually be the case (false positive). Since any screening device has false positives and false negatives, it is up to the provider to determine the level of tolerance for these types of errors with which he or she is comfortable²⁷. We have argued^{17, 28}, given the present state-of-the-art of screening patients at risk of prescription opioid misuse, that it is far less dangerous to misclassify someone as “at risk” when they are not—leading to perhaps overly stringent precautions, than to misclassify someone as “not at risk” when they, in fact are at risk and to institute fewer precautions. In addition, it should be noted that how to operationally define the target (i.e., aberrant in their medication-related behaviors or compliant) at follow-up has not been well-established, nor is the optimal time frame for follow-up currently established. Thus, there is an unknown, possibly substantial, degree of measurement error in our assessment of the target (i.e., misuse or abuse of medications) which the SOAPP-R is attempting to predict. Indeed, the ADBI method used to operationalize misuse or abuse of medications involved making assumptions with which others may disagree (e.g., not counting absence of a prescribed opioid as positive). All of these factors add noise to the data being used to validate and cross-validate a scale like the SOAPP-R. Finally, as Savage¹² notes, screening tools “are useful tools to use together with the interview, physical examination, and longitudinal observations. Positive screens suggest the need for further evaluation” (p. S33). We would never argue that medication decisions be made solely on the basis of a SOAPP-R screening, anymore than a mastectomy would be recommended on the basis of one mammogram. Nevertheless, this cross-validation effort demonstrates that prediction provided by the scale is significantly better than chance, and as noted above, the SOAPP-R score should be considered in light of other clinical data before medication decisions for patients with chronic pain are made.

Conclusions

The SOAPP-R cross-validation yielded promising results. While there was “shrinkage” in the values obtained from this new sample when compared to the initial sample, which is to be expected when applying a measure to a completely new sample of patients, the predictive validity, as measured by the AUC, remained highly significant. The SOAPP-R provides clinicians with the ability to be more aware of patients who may have greater difficulty modulating their own medical use of opioids and who may require extra monitoring and

management. Another possible benefit of the SOAPP-R is to help clinicians identify which patients are at *low* risk for addiction or misuse and may require fewer resources to monitor.

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Diagonal segments are produced by ties.

Fig. 1. Receiver operating characteristic curve SOAPP-R cross validation prediction score sensitivity and specificity estimates gauged against the ADBI. (Note: Diagonal line represents chance prediction)

Table 1

List of SOAPP-R questions

1. How often do you have mood swings?
2. How often have you felt a need for higher doses of medication to treat your pain?
3. How often have you felt impatient with your doctors?
4. How often have you felt that things are just too overwhelming that you can't handle them?
5. How often is there tension in the home?
6. How often have you counted pain pills to see how many are remaining?
7. How often have you been concerned that people will judge you for taking pain medication?
8. How often do you feel bored?
9. How often have you taken more pain medication than you were supposed to?
10. How often have you worried about being left alone?
11. How often have you felt a craving for medication?
12. How often have others expressed concern over your use of medication?
13. How often have any of your close friends had a problem with alcohol or drugs?
14. How often have others told you that you have a bad temper?
15. How often have you felt consumed by the need to get pain medication?
16. How often have you run out of pain medication early?
17. How often have others kept you from getting what you deserve?
18. How often, in your lifetime, have you had legal problems or been arrested?
19. How often have you attended an AA or NA meeting?
20. How often have you been in an argument that was so out of control that someone got hurt?
21. How often have you been sexually abused?
22. How often have others suggested that you have a drug or alcohol problem?
23. How often have you had to borrow pain medications from your family or friends?
24. How often have you been treated for an alcohol or drug problem?

Table 2

Patient demographic and descriptive characteristics (N=302)

Variable	
Age	51.3 (± 13.3 ; range 22-83)
Gender (% female)	50.3
Married (% yes)	51.7
Race (% Caucasian)	79.8
High school graduate (% yes)	88.1
Pain site (% low back)	59.6
Yrs taking opioids	5.8 (± 8.6 ; range 1 mo to 55 yrs)
Pain: [†] Worst (24 hrs; 0-10)	7.1 (± 2.2 ; range 0-10)
Least (24 hrs; 0-10)	4.5 (± 2.4 ; range 0-10)
Average (24 hrs; 0-10)	5.9 (± 1.8 ; range 0-10)
Now (0-10)	5.6 (± 2.4 ; range 0-10)
Pain relief from meds [*] (0-10)	5.5 (± 2.3 ; range 0-10)
Pain interference with [‡]	
General activity	6.0 (± 2.4 ; range 0-10)
Mood	4.7 (± 2.9 ; range 0-10)
Walking	5.8 (± 3.0 ; range 0-10)
Normal work	6.7 (± 2.8 ; range 0-10)
Relations with others	4.0 (± 3.0 ; range 0-10)
Sleep	6.0 (± 3.0 ; range 0-10)
Enjoyment of life	6.1 (± 3.1 ; range 0-10)

[†] 0=no pain; 10=pain as bad as you can imagine

^{*} 0=no relief; 10=complete relief

[‡] 0=does not interfere; 10=completely interferes

Table 3

SOAPP-R score sensitivity and specificity estimates*

Positive if Greater Than or Equal To (a)	Sensitivity	Specificity
1.000	1.000	0.000
3.000	1.000	.015
4.000	1.000	.022
6.000	1.000	.037
7.000	1.000	.074
8.000	1.000	.104
9.000	.985	.148
10.000	.971	.193
11.000	.971	.230
12.000	.971	.281
13.000	.956	.304
14.000	.926	.326
15.000	.882	.370
16.000	.882	.452
17.000	.853	.474
18.000	.794	.519
19.000	.735	.615
20.000	.706	.637
21.000	.662	.659
22.000	.618	.704
23.000	.603	.748
24.000	.588	.756
25.000	.529	.793
26.000	.500	.830
27.000	.500	.844
28.000	.485	.852
29.000	.441	.859
30.000	.397	.881
31.000	.353	.889
32.000	.309	.889
33.000	.279	.896
34.000	.279	.933
35.000	.265	.933
36.000	.235	.941
37.000	.221	.941
38.000	.221	.948
39.000	.176	.948

Positive if Greater Than or Equal To (a)	Sensitivity	Specificity
40.000	.162	.963
41.000	.132	.963
42.000	.103	.963
43.000	.088	.970
44.000	.074	.978
45.000	.059	.993
46.000	.059	1.000
52.000	.029	1.000
59.000	.015	1.000
62.000	.000	1.000

* Gauged against the drug aberrant behavior index (ADBI).

NOTE. SOAPP-R Prediction Scores is the sum of 24 items rated from 0 to 4; possible range = 0 to 96.