

Screening Tools in Nonpain Populations

Drug Abuse Problem Assessment for Primary Care (DAPA-PC)

DAPA-PC is a self-administered, Internet-based screening tool that was developed under a contract from the National Institute on Drug Abuse.(13) Patients initially answer a very brief risk and trauma assessment called the Health and Safety Screen, which does not overtly address substance abuse but rather explores related issues such as depression and physical/emotional abuse over the previous 5 years. The patient's score on this initial screen determines whether he or she will be moved to a second screen, the Drug and Alcohol Problem Screen, which focuses directly on drug and alcohol problems through a series of 12 questions. Once this second screen is completed, the system posts information indicating whether the patient's health is at risk from alcohol or drug use. If such risk exists, the system provides motivational messages and advice to the patient, including health links for the patient to explore. The clinician can then access a summary of the patient's results as well as useful links of interest to healthcare professionals. DAPA-PC can be easily implemented in a primary care setting with the availability of a dedicated computer. It offers the advantage that a trained professional is not needed to administer the questions or score the results. Moreover, because it is completed in private, this tool may be more likely than others to elicit honest answers to questions about alcohol and drug use.

Comment: The DAPA-PC is an intriguing tool that has potential utility for some pain clinics, especially those with electronic medical records in which such an assessment could be incorporated, even before a first clinic visit. This system requires validation in chronic pain samples.

Two-Item Conjoint Screen (TICS)

The TICS is a 2-item self-report questionnaire designed to detect current substance abuse.(14) The questions are scored on a 4-point scale (0 = never, to 4 = often), but a response of "rarely," "sometimes," or "often" is interpreted as a positive reply. This approach is taken to allow patients to minimize their responses while still answering in a positive manner. Each question in TICS is conjoined, in that it asks about alcohol and drug abuse simultaneously. There are three reasons for this: First, people who have problems with a variety of substances may be more likely to give a positive response. Second, people may be more likely to be honest and give positive responses when a question encompasses many drugs, because the question diminishes the fear of possible legal ramifications, the stigma of a specific drug, or other side effects. Finally, clinicians can screen for both alcohol and drug problems in the same amount of time it takes to screen for alcohol problems alone. Nonetheless, there are still problems with this method. Notably, patients who only use alcohol may be hesitant to give positive responses for fear that they may be considered drug users as well.

Brown and coworkers tested the TICS in two phases in adults aged 18 to 59 years.(14) Five questions were administered to a screening cohort of 434

participants in the first phase, and then based on the results, only 2 questions were retained in the second phase and administered to a validity cohort of 702 subjects. Including the other 3 questions did not yield any substantial improvements in identifying substance disorders. Overall, the 2-item TICS had a sensitivity of 79.3% and specificity of 77.9% when there was a positive response to a least 1 item. The TICS is more sensitive to dependence than abuse and particularly well suited for those who have disorders involving marijuana or cocaine. Like all tools, TICS has its down sides; although the negative predictive value was 92.7%, the positive predictive value was only 51.8%. Among respondents with only 1 positive response, the prevalence of substance abuse was 36.5%, and for those with positive responses to both questions, the prevalence was 72.4%. Due to the high false-positive rates, it would be best to administer a more diagnostic test to any patient who has a positive response to either question.

Comment: The TICS is a fairly sensitive and specific—and certainly very rapid—tool. However, to be of greater relevance to pain management, this tool would have to demonstrate consistency and predictive validity in pain patients, who may interpret the questions in an idiosyncratic fashion as compared with the normative sample.

Kreek-McHugh-Schluger-Kellogg Scale (KMSK Scale)

The KMSK scale is an 8-item tool that measures self-exposure to opiates, cocaine, alcohol, and tobacco during the individual's period of greatest consumption. Separate scales are available for each of these substances, which assess the frequency, the amount, the duration, the mode of use, and whether the substance is the individual's substance of choice. The frequency, duration, and amount are transformed into numerical values, and then the total score determined from the sum of these values.

Kellogg et al. (15) assessed the KMSK scale in 100 subjects (mean age, 36.2 years), including healthy volunteers and those with defined addictive diseases, and found different psychometrics for each type of drug. The opioid scale ranges from a score of 0 to 13. A score of 2 or above was sufficient to lead to a dependence diagnosis, but a cutoff score of 9 was optimal, based on a chi-square analysis, having a sensitivity of 100%, specificity of 99%, positive predictive value of 95%, and negative predictive value of 100%. Although the KMSK was able to identify opioid dependence, it was unable to predict the severity of the problem. Because 71% of those who were considered opioid-dependent had 6 or 7 of the 7 SCID-I (Structured Clinical Interview for DSM-IV [*Diagnostic and Statistical Manual of Mental Disorders*, 4th ed.] Axis I Disorders) dependence criteria, the ability to discriminate dependence severity may have been restricted.

The KMSK cocaine scale ranges from 0 to 16. Using a cutoff of 11, the KMSK cocaine subscale had a sensitivity of 97%, specificity of 94%, positive predictive value of 88%, and negative predictive value of 99% in detecting cocaine dependence.(15) A high correlation between the cocaine scale and

number of DSM-IV criteria was found in the subgroup of 31 subjects with cocaine dependence. As with the opioid scale, the cocaine scale correctly assessed dependence but not severity. The range in severity was restricted in the same way as the opioid-dependent subgroup, as 71% met 6 or 7 SCID-I dependence criteria.

Finally, the KMSK alcohol scale ranges from 0 to 13. Using a cutoff of 11, the alcohol scale had a sensitivity of 90%, specificity of 90%, positive predictive value of 69%, and negative predictive value of 97%.⁽¹⁵⁾ A high correlation was found between the KMSK alcohol scale and the SCID-I alcohol scales, although the correlation was lower than those between the opioid and cocaine scales and their respective SCID-I dependence scores. The alcohol scale successfully predicted severity in individuals who were exclusively alcohol dependent, but not in those who had also been dependent on opioids and cocaine.

Comment: The KMSK has not been validated in people with pain. The measure failed in its attempt to quantify the severity of drug dependence in drugs other than alcohol and therefore adds little to other existing screening measures from the vantage point of pain clinicians.

Drug Abuse Screening Test (DAST)

The DAST—a 28-item yes-or-no self-report questionnaire—is designed as a clinical screening tool for substance abuse. A cutoff score of 6 is usually used to indicate drug abuse or dependence problems. Several abbreviated versions of DAST are also used, including DAST-20, DAST-10, and DAST-A, the latter of which is designed for adolescents.⁽¹⁶⁾

The DAST-28 has high internal consistency, with Cronbach's alpha coefficients ranging from 0.92 to 0.94, and high test-retest reliability with a correlation coefficient of 0.85, although the test-retest was only separated by a few weeks. DAST-28 is a highly face-valid instrument; it measures what it is designed to measure, namely, deviant drug use. Because the tool is susceptible to deception, deviant substance abusers who intentionally give false responses may not be identified. The sensitivity of the DAST-28 ranges from 81% to 96%, and specificity ranges from 71% to 94%. Increasing the cutoff from 6 reduces the sensitivity of DAST-28, but increases its specificity. Therefore, a cutoff should be selected that best fits the objectives of the screening purposes.

The DAST-10 includes 10 items from the original questionnaire, 3 of which have been rewritten with minor modifications.⁽¹⁶⁾ It has high internal consistency, with coefficients ranging from 0.86 to 0.94. In a psychiatric population of 45 patients, the DAST-10 had acceptable test-retest reliability over a 2-week period, with a coefficient of 0.71. Using a cutoff score from 1/2 to 3/4, the sensitivity ranged from 95% to 41%, and the specificity from 68% to 99%. The lowest sensitivity and highest specificity came from the same sample of psychiatric patients and was based on discharge diagnosis. If this sample is not considered, the overall predictive accuracy for diagnosis was 70% or higher. The DAST-20 uses the DAST-10 in combination with 10 other items from the original DAST-28 with minor modifications to 2 additional questions. The internal

consistency of DAST-20 ranged from 0.74 to 0.95. In the aforementioned psychiatric patient population, the test-retest reliability over a 2-week period was 0.78. As cutoff scores rose from 3/4 to 5/6, the sensitivity went from 89% to 74%, and the specificity increased from 68% to 83%.

DAST-20 is highly correlated with DAST-28 ($r = 0.99$). In addition, DAST-10 and DAST-20 are highly correlated with each other ($r = 0.97$), and also are highly correlated with other drug, alcohol, and psychiatric indicators. No criterion validity for the DAST-A has been measured. Although the sensitivity of the DAST tests is high, there is still significant variation across study groups. In order to optimally use the DAST tools, it is important to choose cutoffs that match the clinical need. It is better to use a low cutoff when screening drug abusers, but a higher cutoff when screening patients who are not drug abusers.

Comment: The various forms of the DAST have excellent psychometrics and, especially with the briefer versions, are suitable for the pain treatment setting as a measure of substance abuse. The pain clinician could incorporate this scale into pretreatment assessments. The measure has yet to undergo a major validation trial in pain patients. It predicts substance abuse but not specifically aberrant behavior during pain treatment.

Substance Abuse Subtle Screening Inventory (SASSI)

SASSI is an objective screening tool designed to identify patients with a high probability of having a diagnosable SUD, which can be used in a variety of clinical settings. Because some substance abusers may not be able or willing to acknowledge relevant symptoms, SASSI was designed to include both face-valid items, which ask about lifetime frequency of specific behaviors related to substance use, as well as subtle true-or-false items that have no apparent relationship with substance abuse. SASSI-3 is the third version of this instrument. Lazowski et al. (17) evaluated SASSI-3 in a cohort of 1,958 patients from a variety of clinical settings, including addiction treatment centers, general psychiatric hospitals, a vocational rehabilitation program, and a sex-offender treatment program. The internal consistency of SASSI-3 was high, with an alpha coefficient of 0.93. Test-retest reliability over a 2-week period in a subgroup of 40 respondents had stability coefficients of 0.92 to 1.00. When compared with clinical diagnoses of substance dependence according to *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed., revised (DSM-III-R), SASSI-3 showed an overall accuracy of 97% in a cross-validation cohort of 381 subjects, with sensitivity of 97%, specificity of 95%, positive predictive power of 99%, and negative predictive power of 90%. The accuracy of SASSI-3 ranged from 93% to 98% across the 5 clinical settings evaluated. Logistic analyses showed that classifications based on SASSI-3 are not significantly affected by demographic variables or by the level of patient adjustment or functioning.

Comment: SASSI-3 may be particularly relevant for the early identification of people who may have substance dependence or who may not be able to acknowledge symptoms relevant to such dependence. A prospective trial of the

tool's ability to correctly identify pain patients at risk of both substance abuse and aberrant drug-taking behavior would be welcome, given its excellent psychometrics and decreased susceptibility to deception.

Cut Down, Annoyed, Guilty, Eye-Opener Tool, Adjusted to Include Drugs (CAGE-AID)

The CAGE-AID, an adapted version of the famous 4-item CAGE alcoholism screening test, is designed to assess alcohol abuse as well as substance abuse. Essentially, the CAGE-AID questionnaire was adapted by the addition of the phrase "or drug use" to each of the 4 items. Brown and Rounds (18) assessed CAGE-AID in a group of 124 subjects from an academic, community-based family practice. The study participants had a mean age of 38.6 years and came from a mixed community (78% were employed, 48% had an associate degree or higher, 23% had an income at or below the poverty level). Approximately half of the participants met *Diagnostic and Statistical Manual of Mental Disorders, 2nd ed.* (DSM-II), criteria for dependence, with a variety of substance-related diagnoses. Using the standard criterion score of 2 or more positive answers, the sensitivity and specificity of CAGE-AID was 70% and 85%, respectively. When only 1 positive answer was required, the sensitivity and specificity was 79% and 77%, respectively. In this cohort, the CAGE-AID had higher sensitivity in subjects with lower education and income levels.

The CAGE-AID was also tested in a group of 50 type 2 diabetes Northern Plains American Indians at an Indian Health Service hospital.(19) The individual items' coefficients were positively correlated with the total score, and the internal consistency reliability coefficient was 0.92.

Comment: The CAGE-AID has not been validated in pain patients. Nevertheless, its brevity and familiarity to many clinicians make it a reasonable initial screen, after which a more detailed assessment using an aberrant-behavior predicting instrument might be useful. This would be a particularly reasonable approach in many clinics wherein a precise substance-abuse diagnosis is not the goal.

Chemical Use, Abuse, and Dependence Scale (CUAD)

The CUAD is a brief, semistructured interview designed to assess problems with all types of drugs. Although it is an interview, the design of the CUAD is optimized for use in a clinical setting, inasmuch as it does not require a trained interviewer and can be completed in less time than that needed for the Addiction Severity Index (ASI). The CUAD includes only 2 items for those who deny using both alcohol and drugs, but can reach 80 items for those who admit to concurrently using 4 illicit drugs. Although the CUAD is designed to assess current substance use, it can be used to gather information about typical use. Once a subject has admitted to using either drugs or alcohol, questions are asked about the frequency, amount, mode, and duration of use for each substance through a set of 7 categories (17 yes-or-no questions). On the basis of the responses, a total severity score as well as a score for each substance used are calculated.

The presence or absence of a DSM-III-R substance use diagnosis is also determined for each substance.

The CUAD was assessed in a severely mentally ill population, consisting of 100 consecutively admitted adults to a public psychiatric facility.(20) Most were male (72%); African American (75%); either single, divorced, or separated (95%); and unemployed (90%). Most lived with their families, although 15% were homeless. Approximately two-thirds had a psychiatric diagnosis, and more than half had been admitted to a hospital in the previous year. The mean Global Assessment of Functioning scale score in this cohort was 45.3. In this cohort, the CUAD exhibited high interrater reliability (correlation coefficient of 0.98) and high internal consistency for the assessment of alcohol abuse (Cronbach's alpha coefficient of 0.96) as well as the 2 most frequently abused drugs, cocaine (alpha of 0.97) and marijuana (alpha of 0.95) The test-retest reliability over a mean period of 3.4 days for the absence or presence of either an alcohol or a drug use disorder was perfect, with a kappa coefficient of 1.0. Overall test-retest reliability for the total severity score was very high, with a Pearson correlation coefficient of 0.96. The CUAD was shown to be a valid measure, with high correlation to the DAST, Short Michigan Alcohol Screening Test (SMAST), and ASI alcohol and drug scales. The high correlation to SMAST, a self-report assessment of alcohol abuse, probably reflects that 75% of the chemicals being described as "Substance 1" were alcohol.

McGovern and colleagues (21) showed that the predictive validity of the CUAD was tested by its ability to distinguish patients at three levels of substance abuse treatment: inpatient, partial hospitalization, or outpatient. This was assessed based on the assumption that those with the highest scores were the most likely to be in inpatient facilities. In this analysis, the CUAD was able to correctly identify the treatment setting ($P < .001$).

Comment: Overall, the CUAD is a very good tool for assessing SUDs in a hospital-based substance abuse treatment program and in the severely mentally ill population. Additional research is needed to ascertain the validity of the CUAD in other populations, as well as the ability of the CUAD to measure change during treatment. For pain clinicians preferring a structured interview in history taking, this measure may be preferable to others as it can be somewhat shorter than the ASI. A detailed substance abuse history might be particularly needed in high-risk patient groups. However, the CUAD is yet to be validated in a pain patient population, especially those entering treatment wherein the incentive to deceive may be particularly high.

Short Michigan Alcoholism Screening Test, Adjusted to Include Drugs (SMAST-AID)

The SMAST-AID is an adapted version of the self-administered, 13-item SMAST, which is designed to assess both alcohol and substance abuse. SMAST-AID was evaluated in the same academic, community-based family practice sample as that of the CAGE-AID.(18) Using the standard criterion score of 3 or more positive answers, the sensitivity of SMAST-AID was 40% and the specificity was

95%. When the criterion was reduced to 2 positive answers, the sensitivity was 51% and specificity was 92%. Based on these results, Brown and Rounds stopped examining SMAST-AID as a tool for screening alcohol and substance abuse.

Comment: Superior screening tools for assessing alcohol and drug abuse exist and are likely to make this instrument of limited value to pain management.

Relax, Alone, Friends, Family, Trouble (RAFFT) (Adult Studies)

The RAFFT—a 5-item yes-or-no questionnaire for SUD—has been tested on adolescents who were referred to an emergency room or ambulatory evaluation clinic,(22) and on adults who presented to a psychiatric emergency and evaluation center.(23) The RAFFT takes about 1 minute and tests for alcohol and drug abuse, but not the potential of abuse of pain medications specifically. The fifth question (“Have you ever gotten into trouble by drinking/drugging?”) is related to the criteria for substance abuse as defined by DSM-IV. (The DSM-IV criterion for substance abuse captures maladaptive patterns of substance use within the last 12 months, leading to clinically significant impairment or distress, such as failure to fulfill major obligations; recurrent substance use in hazardous situations, such as driving a car; substance-related legal problems; or persistent or recurrent social or interpersonal problems.)

Bastiaens et al. (23) tested this questionnaire in a population of 215 adults and found that the positive and negative predictive values for 2 positive answers were 88.8% and 78.6%, respectively. The best results with RAAFT in this adult cohort were achieved with 3 positive answers, which yielded an overall classification accuracy of 81%. Adults who provided 2 or fewer positive answers had no SUDs 79% of the time. It was also more common for adults to score false positives than it was for adolescents to do so, as shown by the lower levels of specificity in adults than adolescents for 2 positive answers (51% vs. 69%) and 3 positive answers (67% vs. 90%). Like the adolescent population, the adults in this study were likely to have SUD and therefore may not be representative of the overall population.

Comment: The RAFFT is of unclear utility for pain management. It may prove useful in the management of younger populations with pain, particularly those treated in emergency situations, such as sickle-cell anemia patients. The questionnaire’s brevity is a positive feature in such a paradigm, but the tool will require validation in adolescents with pain.

Addiction Severity Index (ASI)

The ASI is a semistructured interview administered by a trained clinician or interviewer. The tool is designed to assess the severity of drug and alcohol abuse as well as employment and psychosocial problems. The interview generally takes about 20 to 30 minutes and uses both objective and subjective information sources as well as current and lifetime experiences to provide severity ratings on a 10-point scale in each of 6 areas commonly affected by

addition.(20) The goal of this assessment is to identify treatment needs in each area. Symptom distress and desire for additional treatment are also obtained. The ASI showed high reliability and validity in assessing these problems in a cohort of 524 male veterans with alcohol and drug addictions.(24) In a cohort of 100 consecutive patients admitted to a public psychiatric facility, the interclass correlation coefficient for the alcohol and drug problem area severity scores on ASI was 0.78 and 0.83, respectively.(20) In this population, the ASI showed high degrees of association with the DAST and CUAD drug scores.

Comment: The ASI is viewed by many in addictions research as the gold standard for the classification of drug abuse and dependence and the quantification of its severity. Its interview format may prove cumbersome for some clinics, but this instrument may prove useful in research clinics or whenever finer distinctions among patients with drug abuse problems is needed.