

**SCREENING IN PRIMARY CARE SETTINGS  
FOR ILLICIT DRUG USE:  
ASSESSMENT OF SCREENING INSTRUMENTS — A  
SUPPLEMENTAL EVIDENCE UPDATE FOR THE U.S.  
PREVENTIVE SERVICES TASK FORCE**

U.S. Department of Health and Human Services

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***Evidence Synthesis***

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# **Screening in Primary Care Settings for Illicit Drug Use: Assessment of Screening Instruments — A Supplemental Evidence Update for the U.S. Preventive Services Task Force**

## **Introduction**

Two approaches have been proposed for identifying illicit drug use and drug abuse among patients seen in routine clinical encounters: toxicologic tests of blood or urine, and standardized screening questionnaires. This report focuses only on the second approach. While toxicologic testing can provide objective evidence of drug use, false-positive results due to cross-reactions, contamination, or mislabeled specimens are always possible. More importantly, these tests do not distinguish between occasional users and individuals who are dependent on or otherwise impaired by drug use.

At the time the USPSTF last examined the use of standardized screening questionnaires for detecting potential drug problems among patients, few screening instruments had been developed specifically for that purpose, and none had been validated in prospective studies. Since 1996, a diverse group of questionnaires for detecting drug misuse has become available. Most of these are modifications of validated alcohol screening instruments. Some were developed for self-administration by patients; others are screening tools for clinicians or clinical practice staff to administer and score; still others are simply a list of questions intended to guide clinician interviews. The instruments vary significantly in length and in the amount of time required to complete them. A number of the questionnaires have yet to be examined for accuracy, reliability, and clinical utility.

To be of benefit in primary care settings, a standardized screening instrument must not only be accurate and reliable in detecting patients with a potential problem: it must also be short and easy to administer so that an undue burden is not placed on the patient or practice staff when it is applied in the busy practice setting. The goals of this review were (1) to identify standardized instruments described in the medical literature that have been designed for detecting use/abuse of illicit drugs; (2) to select those instruments reasonably short enough to have the potential for routine use in a busy primary care practice setting; (3) to determine the extent of published evidence about the accuracy (sensitivity and specificity) and the reliability of potentially useful instruments, and rate the quality of that evidence; and (4) to determine the extent to which validated instruments have been assessed for feasibility and utility when applied in primary care practice settings and among various patient populations.

## **Methods**

We undertook a systematic review of documents identified as of August 2006, from a number of databases. We aimed to identify appropriate, validated screening instruments for the detection of drug misuse among asymptomatic patients seen in ambulatory general medical settings.

We first searched the Substance Abuse Screening and Assessment Instruments database (<http://adai.washington.edu/instruments>) maintained by the University of Washington's Alcohol and Drug Abuse Institute. This regularly updated, comprehensive database contains information on more than 310 questionnaires and interviews that have been offered for detecting or assessing patients with alcohol and/or drug problems. Information on each questionnaire in the database was examined and questionnaires were eliminated from further consideration using the following exclusion criteria:

- (1) Instrument is designed to detect misuse of alcohol only, or of a single drug.
- (2) Instrument is designed primarily for diagnostic purposes or for assessment of those already known to have a substance abuse problem.
- (3) Instrument is not available to the public (not yet published, or subject to a fee for reproduction or downloading)
- (4) Instrument requires specific training to administer or to score/interpret results.
- (5) Instrument contains more than 20 items or takes more than 5 minutes to administer and score.

Using the title or acronym of each remaining questionnaire (i.e., those not excluded using the above criteria), we conducted searches of Ovid Medline and PsychINFO, for the period from 1980 through August 2006, for published evidence in English of the instrument's validity, reliability, and clinical utility. Abstracts of identified articles were screened and rejected if they met the following exclusion criteria:

- (1) Not a study of the specified screening instrument
- (2) Editorial, letter, or other opinion piece
- (3) Study conducted using only a non-English version of the instrument
- (4) Study that examined use of the instrument for a purpose other than screening

Full text articles of non-excluded studies were then examined and critically appraised. When available, the following data were extracted from each study:

- (1) Type of patient population
- (2) Sample size
- (3) Reference standard used
- (4) Sensitivity
- (5) Specificity
- (6) Positive predictive value
- (7) Negative predictive value
- (8) Internal consistency (alpha score)
- (9) Test-retest coefficients (kappa values)

We also noted if the instrument measured recent use or lifetime use, and if it had been evaluated for feasibility and/or clinical utility. We asked if assessment studies were conducted in primary care practice settings.

Studies were rated using previously published USPSTF grading scales. Studies were considered of good quality if they used a credible reference standard, interpreted the reference standard independently of the questionnaire, and included more than 100 patients with and without a drug use problem, some of whom were from a general clinic population.

Studies were considered of fair quality if they used a reasonable, although not the best possible, reference standard, interpreted the reference standard independently of the questionnaire, and included a sample size of 50-100.

Studies were considered of poor quality if an inappropriate reference standard was used, there was a potentially biased ascertainment of the reference standard, or the study included a small (<50) sample size.

## Results

After our exclusion criteria were applied to all instruments described in the SASAI database, we were left with nine instruments potentially useful for screening for drug misuse in primary care practice settings:

- Alcohol, Smoking and Substance Involvement Screening Test (ASSIST);
- Cut down, Annoyed, Guilty, Eye-opener – Adapted to Include Drugs (CAGE-AID);
- Car, Relax, Alone, Forget, Friends, Trouble (CRAFFT);
- Drug Abuse Screening Test (DAST);
- Drug Use Disorders Identification Test (DUDIT);
- Relax, Alone, Forget, Friends, Trouble (RAFFT);
- Reduce, Annoyed, Guilty, Start (RAGS);
- Rapid Drug Problems Screen (RDPS),
- Simple Screening Instrument for Substance Abuse (SSI-SA).

The abstracts of a total of 340 articles, identified from literature searches conducted for each of the nine instruments, were reviewed for relevance using the screening criteria noted above. Of these, 37 citations were selected for review of full-text articles. Most of the excluded abstracts were not studies of the specified screening instrument (e.g., the instrument shared its acronym with some other entity). After full-text articles were reviewed, 16 studies were ultimately included that addressed the validity, reliability or clinical utility of the screening instrument. Of these, 2 evaluated ASSIST, 3 evaluated CAGE-AID, 4 evaluated CRAFFT, 4 evaluated DAST, 2 evaluated RAFFT, and 1 evaluated SSI-SA. No studies reporting on assessments of DUDIT, RAGS or RDPS met our criteria for inclusion.

**Table 1** provides descriptive information about the length, focus, and method of administering the six screening instruments for which published evaluative studies were identified. The instruments ranged in length from the 4-item CAGE-AID to the 28-item DAST. The DAST was retained for further review based on evidence that a shorter (20-item) version of the instrument has comparable psychometric properties.

The results of 16 studies of the accuracy and reliability of the six instruments are presented in **Table 2**. The sensitivities, specificities, and positive and negative predictive values reported are those noted using the cutoff score for a positive screen recommended by the developers of the instrument. A range of sensitivities and specificities has been noted if no specific score for a positive screen was established for the instrument.

There was fair evidence of accuracy and good evidence of reliability of ASSIST; good evidence of accuracy and fair evidence of reliability of CAGE-AID; good evidence of both the accuracy and reliability of CRAFFT; and fair evidence of both the accuracy and reliability of DAST. No published studies were identified assessing the accuracy of the SSI-SA or the reliability of the RAFFT.

No published study reported on the feasibility or usefulness of any of the instruments when applied in the primary care clinical setting. There was also no evidence on the clinical utility of any instrument in screening pregnant women for drug use or misuse.

## **Discussion**

While a fair amount of work has been completed since 1996 on the development and assessment of standardized instruments for screening for drug use and misuse, several studies were considered to be of only fair quality, due to small patient sample size or the failure to include within the sample patients from a general clinic or practice population. A few studies focusing on the accuracy (sensitivity and specificity) of an instrument were considered of only fair quality since they used some other validated instrument (e.g., POSIT) as their reference standard rather than a structured diagnostic interview.

This review was limited to questionnaires considered brief enough to be potentially useful for screening for drug use/misuse in the primary care setting. Toward this end, we set an arbitrary upper limit of 20 items and/or 5 minutes for administration/scoring of the instrument. When assessed, the Drug Abuse Screening Test (DAST), the longest of the instruments considered in this review, was shown to be an accurate and reliable test. The sensitivity and/or specificity of instruments consisting of six or fewer items were lower, though still acceptable. Further testing is needed to determine the optimal tradeoff between questionnaire length and accuracy/reliability of the instrument.

It has yet to be shown how well some of these instruments perform in screening large populations of patients in general medical clinics or practices, where a lower prevalence of drug misuse problems can be expected. For the CAGE-AID, CRAFFT, DAST and RAFFT, more than one published study provided calculations of the instrument's predictive value. Negative predictive values of greater than 90% were noted consistently for each instrument except the RAFFT, which had a NPV of 51-87%. However, more than two-fold variations in positive predictive value were noted between studies of the CAGE-AID, CRAFFT and DAST. Studies reporting the lower PPVs (<30%) were typically conducted among more general, non-selected patient populations in which a

lower prevalence of drug problems can be expected. The positive and negative predictive values of ASSIST were not reported in published studies assessing this test.

The greatest gap in the evidence noticed in this review was the lack of studies that shed light on the feasibility and usefulness of applying screening instruments within a busy practice. Debriefing interviews conducted at the end of the initial testing of ASSIST (1) measured clarity, ease of use, and potential response bias, but the clinical utility of this or other instruments in an actual practice setting has yet to be assessed. In addition to data on rates of offering and completing the screens, qualitative data are needed on the acceptability of the additional burden placed on patients, clinicians, and staff when the test is used routinely in practice.

## **Conclusion**

There is fair evidence that standardized questionnaires considered short enough to be potentially useful in the practice setting have acceptable accuracy and reliability in screening for drug use/misuse. One instrument (the CRAFFT) has been adequately validated for screening adolescents for drug use/misuse. Three instruments of various lengths (ASSIST, CAGE-AID, and DAST-20) have been validated for screening adults. The evidence is not sufficient, however, to establish the positive predictive value of these tests when used in a general medical patient population with a predictably lower prevalence of drug use/misuse. The available evidence does not permit one to determine the overall clinical utility of these instruments when applied in a busy primary care practice setting, and especially in screening pregnant women for drug use.



**Table 1: Questionnaire Instruments Evaluated for Drug Misuse Screening**

<b>Instrument</b>	<b>#items/ Time required</b>	<b>Target population</b>	<b>Measures recent or lifetime use?</b>	<b>Administered by patient or clinician?</b>
ASSIST	8 items	Adults	Recent and lifetime	Clinician
CAGE-AID	4 items	Adults	Lifetime	Clinician
CRAFFT	6 items	Adolescents	Lifetime	Patient
DAST	28/20 items/* 5 minutes	Adults	Lifetime	Patient
RAFFT	5 items	Adults or adolescents	Lifetime	Patient
SSI-SA	16 items	Adults or Adolescents	Lifetime	Clinician or patient

\* The 20-item version of DAST was found to have psychometric properties comparable with the original 28-item version.

**Table 2: Results of Studies Assessing Questionnaires for Drug Misuse Screening**

<b>Instrument/ Author (Reference #)</b>	<b>Study Population</b>	<b>Sample Size</b>	<b>Reference Standard</b>	<b>Sensitivity</b>	<b>Specificity</b>	<b>Positive Predictive Value</b>	<b>Negative Predictive Value</b>	<b>Internal Consistency (alpha)</b>	<b>Test- Retest (kappa)</b>
ASSIST WHO (1)	60% in drug Rx 40% from gen'l med facility	236						0.85-0.91	0.58- 0.90
ASSIST Newcombe (2)	Primary care, Drug treatment	150	Other instrument	90%	78%	Not reported	Not Reported		
CAGE-AID Brown (3)	Academic Community FP	124	Diagnostic Interview	79%	77%	78%	78%		
CAGE-AID Hinkin (4)	Elderly abusers & non-abusers	976	Clinical Interview	81-92%	48-72%	12-18%	98-99%		
CAGE-AID Leonardson(5)	Am Indians at Diabetic clinic	50						0.92	
CRAFFT Knight (6)	Adolescents with known drug use	99	Personal Experience Inventory	92%	82%	Not reported	Not Reported	0.79	
CRAFFT Knight (7)	Adolescent Clinic	538	Structured diagnostic interview	76%	94%	83%	91%	0.68	

<b>Instrument/ Author (Reference #)</b>	<b>Study Population</b>	<b>Sample Size</b>	<b>Reference Standard</b>	<b>Sensitivity</b>	<b>Specificity</b>	<b>Positive Predictive Value</b>	<b>Negative Predictive Value</b>	<b>Internal Consistency (alpha)</b>	<b>Test- Retest (kappa)</b>
CRAFFT Cummins (8)	Am-Indian adolescents in clinics/schools	70	Structured interview (CASI-A)	86%	76%	29%	98%	0.81	
CRAFFT Levy (9)	Adolescent clinic	93							0.71- 0.86
DAST Skinner (10)	Drug/alcohol Abuse clients	256						0.92	
DAST Staley (11)	Psychiatric Patients	250	Diagnostic Interview	82-96%	81-91%	63-75%	94-98%	0.92	
DAST El-Bassel (12)	Adult workers	176						0.92	0.70
DAST McCann (13)	Adults evaluated for ADHD	143	Diagnostic Interview	85%	71%	23%	98%	0.92	
RAFFT Bastiaens (14)	Adolescents in ER with psych problem	226	Diagnostic Interview	89%	69%	73%	87%		
RAFFT Bastiaens (15)	Adults seen in psych ER	215	Neuropsych Interview	84%	67%	91%	51%		
SSI-SA Knight (16)	Adolescent Clinic	173						0.83	0.9

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