

# IMPAIRED DRIVING RISK ASSESSMENT



## A PRIMER FOR PRACTITIONERS

### RISK ASSESSMENT INSTRUMENTS



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# **IMPAIRED DRIVING RISK ASSESSMENT: A PRIMER FOR PRACTITIONERS**

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## **RISK ASSESSMENT INSTRUMENTS**

*This document is an extracted chapter from the 'Impaired Driving Risk Assessment: A Primer for Practitioners' publication. The full report as well as a complete reference list are available online at [www.tirf.ca](http://www.tirf.ca). You may also download directly the executive summary or any other chapters of the full report.*

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## 6. RISK ASSESSMENT INSTRUMENTS

The effective management of the many different types of impaired drivers is based upon the identification and development of a range of supervision strategies and interventions specifically geared towards those offenders who are more or less amenable to behaviour change. This is a fundamental principle of evidence-based practices. Of considerable importance, the use of valid and reliable risk assessment instruments is essential to accurately differentiate between the different types of impaired drivers that exist and ensure that they are streamed into appropriate interventions designed to address their specific risks and needs.

A number of standardized assessment instruments are available to help quickly identify current and potential alcohol problems<sup>1</sup>. Generally speaking, these instruments are based upon a series of cutoff scores associated with the probabilities of re-offending to place offenders into specific groups or types (DeMichele and Payne 2013). Regarding their use with impaired driving offenders, it has been suggested these instruments place a disproportionate focus on alcohol use and, as such, suffer from “tunnel vision.” Importantly, research has shown that some offence types are more accurately classified when using instruments developed specifically for those offence categories (e.g., domestic violence offenders, sex offenders).

These assessment tools are designed to identify as many potential cases as possible, while at the same time minimizing the number of false-positives (i.e., identifying someone as “high-risk” for re-offending when they are not). Some of these instruments are not as strong and have demonstrated limited validity and reliability in relation to the accurate prediction of future impaired driving events, including the following:

- Mortimer Filkins (MF) (Chang et al. 2002; Wendling and Kolody 1982); and
- Driver Risk Inventory (DRI) (Chang et al. 2002).



<sup>1</sup> It is important to recognize that not all screening instruments commonly used among impaired drivers are designed to detect drug use. Instruments that will detect drug use include Alcohol, Smoking, Substance Involvement Screening Test (ASSIST), Cut-down, Annoyed, Guilty, Eye-opener Adapted to Include Drugs (CAGE AID), Addiction Severity Index (ASI), and Global Appraisal of Individual Needs (GAIN).

In light of the strengths and weaknesses associated with many of the available instruments, a majority of jurisdictions rely on the outcomes of several instruments during the assessment process in order to produce a more complete picture of impaired driving offenders.

This section briefly describes some of the instruments that are most commonly used across Canada and the United States. Each instrument is described in terms of type of administration, who it can be administered by, number of items, time required for administration, training required for administration, scoring, summary of psychometrics, limitations, cost, and source. In addition, a few key references are identified in relation to each instrument in order to provide additional information to practitioners seeking more knowledge about the risk assessment instrument.

The following is a list of the instruments described in this section:

- > ADS (Alcohol Dependence Scale);
- > ASUDS-R (Adult Substance Use and Driving Survey – Revised);
- > ASI (Alcohol Severity Index);
- > AUDIT (Alcohol Use Disorders Identification Test);
- > IDTS (Inventory Drug-Taking Situations);
- > DAST (Drug Abuse Screening Test);
- > LSI-R (Level of Service Inventory-Revised);
- > MAST (Michigan Alcoholism Screening Test);
- > SASSI (Substance Abuse Subtle Screening Inventory);
- > RIASI (Research Institute on Addiction Self Inventory); and,
- > Biomarkers.

There are no clear indications of the superiority of any one screening instrument or set of instruments and procedures. Research suggests that the selection of specific instruments and procedures should be guided by the needs and resources in particular jurisdictions (Beirness et al. 1997). It warrants mentioning that adapting instruments can jeopardize their validity and may require further research. More importantly, relevant laws pertaining to copyright should be reviewed.

When reading through the summary of psychometrics for each instrument there are some important caveats to note with regard to the metrics pertaining to reliability and validity. Validity measures examine how well an instrument separates recidivists from non-recidivists. The area under the curve is a commonly used statistic to assess predictive discrimination. Reliability looks at how consistently the instrument can be scored across raters (e.g., if ten

raters each score the same case to what extent will there be agreement among raters). The intraclass correlation coefficient (ICC) is a commonly used measure of inter-rater reliability. In particular, Cronbach's alpha provides another look at reliability insofar as it examines internal consistency among items. So in these instances, Cronbach's alpha is, in fact, a somewhat narrow, albeit important, look at reliability as it examines internal consistency among items.

With regard to the studies reviewed, a commonly accepted interpretation of these numbers is 0.80 and over is considered a very good; 0.70 to 0.80 is considered acceptable; 0.60 to 0.70 is considered questionable; 0.50 to 0.60 is poor; and less than 0.50 is unacceptable (George and Mallery 2003).

## 6.1 Alcohol Dependence Scale (ADS)

### Brief description

The ADS provides a quantitative measure of the severity of alcohol dependence consistent with the concept of the alcohol dependence syndrome. The 25 items cover alcohol withdrawal symptoms, impaired control over drinking, awareness of a compulsion to drink, increased tolerance to alcohol, and salience of drink-seeking behaviour. The ADS yields a measure of the severity of dependence that is important for treatment planning, especially with respect to the intensity of treatment.

The printed instructions for the ADS refer to the past 12-month period. However, instructions can be altered for use as an outcome measure at selected intervals (e.g., 6 months, 12 months, 24 months) following treatment.

The ADS can be completed in approximately five minutes and as a result can be used for screening and case-finding in a variety of settings including health care, corrections, general population surveys, workplace, and education. Guidelines are given for using the ADS with respect to treatment planning, particularly with respect to the level of intervention.

A French language translation is available.

### Type of administration

Pencil-and-paper self-administered

- > Interview
- > Computer self-administered

### Administered by

- > Self

### Number of items

- > 25

### **Time required for administration**

- > 5 minutes

### **Training required for administration**

- > Yes, only basic training needed

### **Scoring**

- > Administrator or by computer

### **Summary of psychometrics (reliability/validity)**

The ADS is widely used as a research and clinical tool, and studies have found the instrument to be reliable and valid. The ADS can be used for basic research studies where a quantitative index is required regarding the severity of alcohol dependence. For clinical research, the ADS is a useful screening and case-finding tool. It is also of value with respect to matching clients with the appropriate intensity of treatment and for treatment outcome evaluations.

Items making up the ADS were found to have good internal consistency (measuring whether several items that propose to measure the same general construct produce similar scores;  $\alpha = .92$  Skinner and Horn 1984). The scale consists of three factors: the first major factor accounted for items reflecting withdrawal symptoms, the second and third smaller factors were made up of items reflecting obsessive compulsive drinking patterns and loss of behavioural control (Skinner and Horn 1984).

The ADS has good concurrent validity (demonstrated that test correlates well with a measure that has previously been validated). Skinner and Horn (1984) reported that the ADS score was correlated with both daily consumption of alcohol and lifetime use of alcohol, social consequences from drinking, prior treatment for alcohol abuse, use of alcohol to change mood and feelings of guilt over drinking. The ADS was also significantly correlated with the MAST (Skinner and Horn 1984; Ross et al. 1990).

The ADS has been successfully adapted for use with a variety of different cultures and ethnic groups (Fu et al. 2008; Rajendran and Cheridan 1990; Solís et al. 2007). The translated versions of the ADS were found to have high internal reliability (referring to the extent to which a measure is consistent within itself). The ADS was found to correlate well with alcohol-related problems and post-release drinking goals with incarcerated male offenders (Hodgins and Lightfoot 1989).

The ADS appears to be an equally valid and reliable measure of alcohol dependence in women (Chantarujikapong et al. 1997; Drake and Mercer-McFadden 1995). Internal consistency (measuring whether several items that propose to measure the same general construct produce similar scores) is also high in this population (ranging from .85 [dependent participants] to .99 [total sample]; Chantarujikapong et al. 1997). The ADS has been used

successfully in several studies investigating alcohol dependence in homeless and incarcerated women, and studies of alcohol misuse in Australian female university students (e.g., Biron et al. 1995; Chantarujikapong et al. 1997; Williams et al. 1998).

### **Limitations**

- > Cost for use
- > Limited to alcohol dependence assessment only

### **Cost**

#### **User's guide**

- > ISBN 978-0-88868-091-4 • 34 pages • booklet/guide
- > \$17.95 • published 1984 • product code PG010
- > Available in English only

#### **Questionnaires (package of 25)**

- > \$11.00 • published 1984 • product code P143
- > Available in English and French

#### **ADS kit (User's Guide and 25 Questionnaires)**

- > \$20.95 • published 1984 • product code PG011

Download a PDF version of the Order Form: [http://www.camh.net/Publications/CAMH\\_Publications/camh\\_publications\\_orderform.pdf](http://www.camh.net/Publications/CAMH_Publications/camh_publications_orderform.pdf)

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### **Source**

Harvey Skinner

Multi-Health Systems regarding the Computerized Lifestyle Assessment:

1-800-268-6011 (Canada)

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## 6.2 Adult Substance Use and Driving Survey – Revised (ASUDS-R)

### Brief description

The ASUDS-R is a 123 item psychometric-based, self-report screening instrument that also incorporates information gathered through collateral data and an individual interview. Its purpose, according to Wanberg and Timken (2006) is to “provide a differential screening assessment of the driving while impaired (DWI) offender in the areas of substance use and abuse, alcohol involvement, and other areas of life-adjustment problems” (p.8).

The ASUDS-R assesses an individual’s alcohol and other drug use involvement in ten categories of drugs, and measures the degree of disruption that might result from the use of these drugs. The ASUDS-R provides a specific measure of the degree of involvement in the use of alcohol, and a specific measure of driving-risk attitudes and behaviours. It also provides a screen for emotional or mood adjustment problems, a measure of social non-conformity, a measure of legal non-conformity, a measure of defensiveness or resistance to self-disclosure, and a scale to assess motivation and readiness for treatment. It provides measures of alcohol and other drugs (AOD) involvement and legal conformity for the most recent six month period the client has been in the community.

The ASUDS-R can be used to provide guidelines for assessing levels of alcohol or other drug problems, abuse, and dependence. It can also be used to provide referral guidelines for various levels and types of services for impaired driving offenders. It can be used to assess during and post-treatment changes.

### Type of administration

- > Pencil-and-paper and automated version

### Administered by

- > Self or practitioner

### Number of items

- > 123

### Time required for administration

- > 20-30 minutes

### Training required for administration

- > Comprehensive training is required to administer the instrument and interpret its scores.

## Scoring

The ASUDS-R is scored using four weighted scales and can also include collateral data, including BAC at arrest, prior substance abuse treatment, and prior impaired driving arrests or convictions.

## Summary of psychometrics (reliability/validity)

A study conducted by Wanberg and Timken (2007, unpublished) of the psychometric properties found the analytical results were largely favorable. Internal consistency (measuring whether several items that propose to measure the same general construct produce similar scores) reliabilities were within optimal range. Each scale was found to render a unique dimension, inter-correlations among scales were consistently positive, consistency of measurement among different samples was strongly supported, and robust correlations were found with external criterion tests and scales. Evidence was found to support the use of the ASUDS-R scales independently and in combination with collateral variables to provide service guidelines for impaired driving offenders.

Wanberg and Timken (2007, unpublished) also found the ASUDS-R to be a valid self-report differential screening instrument that provides sound guidelines for decision-making, particularly when integrating findings from other report data (e.g., BAC, prior offences), and when used in combination with placement criteria such as those developed by the American Society of Addiction Medicine.

The User's Guides for the original ASUDS and ASUDS-R provide a detailed summary of scale construct validation studies.

## Limitations

- > Cost of use
- > Limited peer reviewed examination of the psychometric properties in published journals
- > Review of instrument has only been done by the authors of the instrument
- > Has not been included in any meta-analysis reviews of screening instruments

## Cost

Costs are not listed on website. Please use the following links to contact Dr. Wanberg about costs.

The computerized version can be purchased from Dr. Wanberg's web site: [http://aodassess.com/software\\_applications/how\\_to\\_buy.htm](http://aodassess.com/software_applications/how_to_buy.htm).

To inquire about use of the paper version, see <http://aodassess.com/apps/contactus.aspx>.

## Source

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<http://www.wilder.org/download.0.html?report=2025>

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## 6.3 Alcohol Severity Index (ASI)

### Brief description

The ASI is an assessment instrument designed to be administered as a semi-structured interview. The instrument gathers information about seven areas of a patient’s life: medical, employment/support, drug and alcohol use, legal, family history, family/social relationships, and psychiatric problems. In approximately one-hour a trained interviewer can gather information on recent (past 30 days) and lifetime problems in all of the aforementioned areas. The ASI provides an overview of problems related to substance, rather than focusing on any single area.

The ASI can be used effectively to explore problems within any adult group of individuals who report substance abuse as their major problem. It has been used with psychiatrically ill, homeless, pregnant, and prisoner populations, but its major use has been with adults seeking treatment for substance abuse problems. The ASI has been used extensively for treatment planning and outcome evaluation. Outcome evaluation packages for individual programs or for treatment systems are available.

More recently, the Treatment Research Institute (TRI) that developed the ASI has released a Risk and Needs Triage (RANT) decision support tool for judges and other justice decision makers to assist in matching drug-involved offenders to the community corrections program best suited to their supervision and treatment needs. Efforts are underway to develop a similar tool that is designed for an impaired driving offender population (Marlowe 2008).

### **Type of administration**

- > Pencil-and-paper self-administered
- > Interview
- > Computer self-administered

### **Administered by**

- > Self

### **Number of items**

- > 161

### **Time required for administration**

- > 45 to 75 minutes

### **Training required for administration**

- > Training is required. There is a self-training packet available, as well as onsite training by experienced trainers.

### **Scoring**

- > Takes about 5 minutes to score.
- > The ASI provides two scores: severity ratings are subjective ratings of the client's need for treatment, derived by the interviewer; composite scores are measures of problem severity during the prior 30 days and are calculated by a computerized scoring program.

### **Summary of Psychometrics (reliability/validity)**

According to SAMHSA (2005) "The ASI is highly correlated with objective indicators of addiction severity. The ASI is also one of the few instruments that measure several different functional aspects of psychosocial functioning related to substance abuse and provide a concise estimate of the history of substance abuse as well as recent use. The instrument provides severity ratings in each functional area assessed, which are useful both clinically and for research purposes" (p. 20).

The instrument has demonstrated high reliability and concurrent validity (demonstrated that test correlates well with a measure that has previously been validated - Leonhard et al. 2000; McLellan et al. 1992a; Schottenfeld and Pantalon 1999). The items in each of the seven areas have been tested for understanding and test-retest reliability (measures stability of the scores over time) as well as concurrent, predictive, and discriminate validity (tests whether concepts or measurements that are supposed to be unrelated are, in fact, unrelated) among adults of both genders and most large ethnic groups (McLellan et al. 1985; Kosten et al. 1983; Hendriks et al. 1989). The ASI has become very widely used mainly due to extensive psychometric testing, a comprehensive training manual (plus other instructional materials), and its availability in the public domain.

A self-report version of the ASI has been shown to be a reliable and accurate alternative to the counselor-administered instrument (SAMHSA 2005), however, the latter is the more preferred approach given the recognized limitations associated with self-report instruments.

Numerous publications were found reporting the reliability and validity of the ASI for opioid users, crack and cocaine users, those with mental illness, the homeless, gamblers, and those in rehabilitation, detoxification, and various drug treatment programs (Drake et al. 1995; Fureman et al. 1994; Hendricks et al. 1989; Hodgins and El-Guebaly 1992; Joyner et al. 1996).

### **Limitations**

- It should not be used in group testing or for fast screening
- Limited research using an impaired driving offender population
- Designed as an assessment tool and not a screening tool

### **Cost**

There is no cost as a result of the instrument being public domain. A minimal charge for photocopying and mailing may apply. A free scoring disk is provided with the training materials, and there is a software program to provide written evaluations and treatment plans (there is a cost for this program).

### **Source**

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Treatment Research Institute. The Addiction Severity Index. <http://www.tresearch.org/ASI.htm>

## 6.4 Alcohol Use Disorder Identification Test (AUDIT)

### Brief description

The AUDIT was developed by the World Health Organization (WHO) to identify persons whose alcohol consumption has become hazardous or harmful to their health. The AUDIT is a 10-item screening questionnaire with three questions on the amount or frequency of drinking, three questions on alcohol dependence, and four questions on problems caused by alcohol.

The AUDIT screening procedure is linked to a decision process that includes brief intervention with heavy drinkers, or referral to specialized treatment for patients who show evidence of more serious alcohol involvement.

A French language translation is available.

### Type of administration

- > Pencil-and-paper self-administered
- > Interview
- > Computer self-administered

### Administered by

- > Health professional

### Number of items

- > 10

### Time required for administration

- > 2 minutes

### Training required for administration

- > Yes, there is a user's manual and a videotape training module that explains proper administration procedures, scoring interpretation, and clinician management.

### Scoring

- > An easy-to-use brochure has been designed to guide the interviewer and to assist with scoring and interpretation.

## Summary of psychometrics (reliability/validity)

AUDIT's test-retest reliability has shown good temporal stability ( $r = .88$ ) (Daeppen et al. 2000). Internal reliability (referring to the extent to which a measure is consistent within itself) has been consistently strong, with Cronbach's alpha scores in the range of .80-.94 (Allen et al. 1997; Bohn et al. 1995; Shields and Caruso 2003). AUDIT scores have been used to predict alcohol-related physical disorders and social problems (Conigrave et al. 1995a; Conigrave et al. 1995b). Similarly, the AUDIT score was also shown to be a better predictor of subsequent alcohol-related medical and social problems than standard biochemical markers (Conigrave et al. 1995b).

The psychometric properties of the AUDIT have been explored in a number of populations, including inpatient care, rural and urban communities, emergency room patients, the unemployed, and college students (Reinert and Allen 2002). Research shows that the AUDIT may be especially useful when screening women and minorities (Reinert and Allen 2002).

A 2007 meta-analysis of 19 relevant studies (Berner et al.) reported that sensitivity ranged from .31 to .89 and specificity ranged from .83 to .96 across the eight studies conducted in primary care. A single trial in general hospital inpatients found a sensitivity of .93 and a specificity of .94; another trial in emergency department patients found a sensitivity of .72 and a specificity of .88. A study involving university students found a sensitivity of .82 and a specificity of .78. Three studies in elderly patients found sensitivities between .55 and .83 at a pooled specificity of .96. The authors concluded the large heterogeneity between results could only partly be explained by setting diversity (Berner et al. 2007).

## Limitations

- > Limited to alcohol screening
- > Not enough research has been completed to determine precise cut-off points
- > Designed for early detection of alcohol problems in the general population

## Cost

- > Test and manual are free
- > Training module costs \$75.00

## Source

World Health Organization

Division of Mental Health & Prevention of Substance Abuse

CH-1211, Geneva 27, Switzerland

Website: [http://whqlibdoc.who.int/hq/2001/who\\_msd\\_msb\\_01.6a.pdf](http://whqlibdoc.who.int/hq/2001/who_msd_msb_01.6a.pdf)

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## 6.5 Inventory of Drug-Taking Situations (IDTS)

### Brief description

The IDTS, developed by Annis and Martin (1985), is a 50-item self-report questionnaire that provides a profile of the situations in which a client has used alcohol or another drug over the past year. The IDTS is a treatment-planning tool that provides a profile of a client's high-risk situations for drinking (or other drug use) that can be used in the development of an individual treatment plan. It is a parallel instrument to the Inventory of Drinking Situations (IDS). Clients are asked to indicate their frequency of heavy drinking or drug use in each of 50 situations on a four-point scale ranging from "never" to "almost always." The questionnaire

may be administered in either pencil-and-paper or computerized version; the latter allows a client to name up to three substances that are currently causing a problem; the 50 IDTS items are presented for each substance in turn, and a computer-generated report is produced for each substance. Eight subscales are used, providing a profile of the client's use across eight types of high-risk situations: unpleasant emotions, physical discomfort, pleasant emotions, testing personal control, urges and temptations, conflict with others, social pressure to use, and pleasant times with others (Marlatt and Gordon 1980; 1985).

A French language translation is available.

### **Type of administration**

- > Pencil-and-paper self-administered
- > Computer self-administered

### **Administered by**

- > Self

### **Number of items**

- > 50

### **Time required for administration**

- > 10 minutes

### **Training required for administration**

- > No, detailed instruction for administration and scoring are given in the User's Guide. The software version presents instructions for administration on-screen and provides instantaneous scoring and presentation of the client's profile.

### **Scoring**

- > Can be done by hand or computer

### **Summary of psychometrics (reliability/validity)**

The IDTS is a well-validated assessment tool that has been used in a wide array of clinical and treatment contexts. This instrument is appropriate for use in both individual and group programs, and with clients whose substance problems range from mild to severe. Within some programs, the IDTS is used to provide an individualized profile of a client's drug and/or alcohol use. This information is used to plan treatment, identify and address high-risk triggers for relapse, and assist in planning for aftercare.

Turner et al. (2007) established validity evidence for the IDTS by demonstrating correlations with measures of drug consumption, problem severity, and dependence. Clients who

reported drinking heavily or using drugs across situations on the IDTS also reported higher levels of consumption and greater problem severity (i.e., years of problematic use, perceived seriousness of the problem, and perceived difficulty quitting). There has been a strong pattern of correlations observed between IDTS scores and measures of dependence, such as DAST and ADS (Skinner 1982; Skinner and Horn 1984), which provides further external validity evidence for the IDTS. In addition to a strong association with IDTS total score, high levels of drug dependence were most strongly associated with elevations on the IDTS negative subscales (i.e., Unpleasant Emotions, Physical Discomfort, and Conflict with Others) and with the Urges and Temptations to Use subscale. These results are in agreement with previous findings involving cluster analysis of scores on the IDS; high negative profile clients were found to have higher alcohol dependence scores (Annis and Graham 1995). Internal consistency (measuring whether several items that propose to measure the same general construct produce similar scores) values for each subscale range from .59 - .92, and most were over .80 for a sample of incarcerated offenders (Addictions Research Foundation 1998).

### Limitations

- Limited in scope (because it focuses on drug use) but useful in examining specific aspects of substance use.

### Cost

#### IDTS user's guide

- ISBN 978-0-88868-290-1 • 148 pages • paperback
- \$34.95 • published 1997 • product code PG082

#### IDTS alcohol questionnaires (package of 30)

- \$16.45 • published 1997 • product code P162

#### IDTS drug questionnaires (package of 30)

- \$16.45 • published 1997 • product code P163

### Source

The Centre for Addiction and Mental Health

33 Russell Street

Toronto, Ontario, M5S 2S1

Phone: 416-535-8501 ext. 6059

Email: [publications@camh.net](mailto:publications@camh.net)

Website: [http://www.camh.net/Publications/CAMH\\_Publications/inventory\\_drug\\_taking\\_situations.html](http://www.camh.net/Publications/CAMH_Publications/inventory_drug_taking_situations.html)

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## 6.6 Drug Abuse Screening Test (DAST)

### Brief description

The DAST was developed in 1982. It is constructed similarly to the earlier MAST, and the DAST items tend to be parallel with those of the MAST. The purpose of the DAST is to provide a brief, simple, practical, but valid method for identifying individuals who are abusing psychoactive drugs and to yield a quantitative index score of the degree of problems related to drug use and misuse. Respondents are instructed that "drug abuse" refers to the use of prescribed or over-the-counter drugs in excess of the directions and any non-medical use of drugs.

Since the DAST is one of the few instruments for assessment of drug use and related problems that has reported the relationship of the scores obtained to diagnosis of abuse, it

may be of interest to those programs that are more diagnostically or psychiatrically oriented. The DAST provides a score that should be sensitive to changes in substance using experiences over a 6 and 12-month follow-up period.

The questions do not refer to the use of alcoholic beverages.

### **Type of administration**

- > Pencil-and-paper self-administered
- > Interview
- > Computer self-administered

### **Administered by**

- > Self

### **Number of items**

- > There is a 10-item version, a 20-item version, and a 28-item version

### **Time required for administration**

- > 5 to 20 minutes depending on the version

### **Training required for administration**

- > For a qualified drug counsellor, only a careful reading and adherence to the instructions in the “DAST Guidelines for Administration and Scoring,” which is provided, is required. No other training is required.

### **Scoring**

- > Administrator or by computer

### **Summary of psychometrics (reliability/validity)**

The DAST has been evaluated and demonstrated excellent reliability and diagnostic validity in a variety of populations and settings.

The DAST has been shown to have good internal consistency reliability (measuring whether several items that propose to measure the same general construct produce similar scores; 28-item DAST; Cronbach’s alpha = .92; 20-item DAST, Cronbach’s alpha = .95) and criterion validity (assessing the correspondence between the score on the instrument and the scores on selected outcome variables; Skinner 1982). It was found to correlate highly with the ASI (Skinner and Goldberg 1986). Scores have also been found to correlate highly with the frequency of use for a range of drugs including cannabis, barbiturates, amphetamines, and opiates.

DAST scores also discriminated accurately between alcohol and drug problems (Appleby et al., 1997). The authors suggest a cut-off score of 5/6 for optimum sensitivity and specificity on the 28-item DAST. Similarly, a cut-off score of 3 on the 10-item DAST correctly classified 93% of patients (Bohn et al. 1991). In a recent meta-analysis, the DAST was found to be an easy to administer, reliable, and valid tool with good sensitivity and specificity. In general, all versions of the DAST yielded satisfactory levels of reliability and validity for use as clinical or research tools (Yudko et al. 2007).

Internal reliability (referring to the extent to which a measure is consistent within itself) was consistently high (.74-.95) for each version of the DAST. A test-retest (measures stability of the scores over time) correlation coefficient of 0.85 was reported for DAST-28, 0.78 for DAST-20, 0.71 for DAST-10, and 0.89 for an adolescent version (DAST-A). A review also found evidence supporting the construct, criterion, and discriminant validity of the DAST (Yudko et al. 2007).

Research has evaluated the DAST with various populations and settings including psychiatric patients (Cocco and Carey 1998; Maisto et al. 2000; Staley and El Guebaly 1990), prison inmates (Peters et al. 2000), substance abuse patients (Gavin et al. 1989), primary care (Maly 1993), in the workplace (El-Bassel et al. 1997), and been adapted for use with adolescents (Martino et al. 2000). Overall, these studies support the reliability and diagnostic validity of the DAST in diverse contexts.

### Limitations

- > Does not screen for alcohol use/abuse
- > Since the content of the items is obvious, clients may fake results
- > Scores may be misinterpreted
- > Should NOT be administered to persons actively under the influence of drugs or who are undergoing drug withdrawal reaction

### Cost

- > \$18.95 • booklet/guide + pad of 100 questionnaires
  - » published: 1992 • product code: PZ077
- > \$14.95 • pad of 100 questionnaires only
  - » published: 1992 • product code: PZ075

### Source and copyright

Copies of the DAST may be obtained from H. Skinner,  
Centre for Addiction and Mental Health,

33 Russell Street, Toronto, Ontario,  
Canada M5S 1A8,

Telephone: 1-800-463-6273

E-mail: [harvey.skinner@utoronto.ca](mailto:harvey.skinner@utoronto.ca)

<http://www.camh.net>

A computerized version of the DAST is included in the Computerized Lifestyle Assessment (Skinner 1994) published by Multi-Health Systems, Toronto (<http://www.mhs.com>)

Telephone: 1-800-268-6011 in Canada

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## 6.7 Level of Service Inventory-Revised (LSI-R)

### Brief description

The foundation of the LSI-R instrument is entrenched in social and psychological theories that explain the propensity towards criminal behaviour. It is a quantitative survey of attributes of offenders and their situations relevant to level of supervision and treatment decisions. Designed for ages 16 and older, the LSI-R helps predict parole outcomes, success in correctional halfway houses, institutional misconducts, and recidivism. The 54 items are based on legal requirements and include relevant factors needed for making decisions about risk and treatment. The LSI-R has ten domains including criminal history, education/employment, financial, family/marital, accommodation, leisure/recreation, companions, alcohol/drug problem, emotional/personal, and attitudes/orientation. The LSI-R Manual explains the use of the LSI-R and summarizes research studies on its reliability and validity.

The LSI-R can be used by probation and parole officers and correctional workers at jails, detention facilities, and correctional halfway houses to assist in the allocation of resources, help make decisions about probation and placement, make appropriate security level classifications, and assess treatment progress.

### Type of administration

- > Interview

### Administered by

- > Health professional

### Number of items

- > 54

### Time required for administration

- > 30–45 minutes

## Training required for administration

- > A professional with advanced training in psychological assessment or a related discipline must assume responsibility for the use, interpretation, and communication of the results.

## Scoring

- > Administrator or by computer

## Summary of psychometrics (reliability/validity)

According to the manual the LSI-R has strong reliability and validity, which has been demonstrated in the many studies presented in the Technical Manual. The following psychometrics come from the LSI-R User's Manual including details on the reliability and validity of the LSI-R assessment (Andrews and Bonta 2001).

The test-retest reliability (measures stability of the scores over time), which is consistent over the short term, can be seen because many items are dynamic and the LSI-R is changeable over the long term. Internal consistency reliability (measuring whether several items that propose to measure the same general construct produce similar scores) shows mild to moderate statistically significant positive correlations. Face validity (a property of a test intended to measure something) is evident because the LSI-R items were based on practitioner input. Construct validity (the extent to which what was meant to be measured was actually measured) is shown through LSI-R scores' relationship to rule violations. The LSI-R has a low false-negative rate which demonstrates discriminant validity (tests whether concepts or measurements that are supposed to be unrelated are, in fact, unrelated; Andrews and Bonta 2001).

## Limitations

- > The LSI-R is somewhat effective in predicting the risk for offenders; it was developed for the purpose of correctional management, not for correctional counseling.
- > Does not include items that assess how offenders perceive themselves and interactions with others and how they explain their conflicts.

## Cost

- > LSI-R Complete Kit - \$484.00
  - » Includes Manual; 25 Interview Guides; 25 Forms; 25 Profile Forms
- > Hand Scoring Materials
- > LSI-R Manual - \$143.00
- > LSI-R Interview Guides (25) - \$176.00

- > LSI-R Forms (25) - \$110.00
- > LSI-R ColorPlot Profile Forms (25) - \$55.00
- > LSI-R Training DVD Series - \$660.00
  - » A training DVD series presenting a non-technical approach to using the LSI-R.
- > LSI-R Trainer Workbook - \$93.50
- > Computer Scoring Materials
  - » LSI-R Manual - \$143.00
  - » LSI-R Data Entry Sheets (50) - \$66.00
  - » Pack of 50. Optional for use when computer scoring.
- > Computer Generated Reports
  - » LSI-R Profile Report (V5) - Min. purchase of 10 reports. Price per report. - \$19.80
  - » Minimum purchase of 10 reports. Price per report.

### Source and copyright

Don Andrews, Ph.D. & James Bonta, Ph.D.

MHS Inc.

3770 Victoria Park Ave.

Toronto, Ontario M2H 3M6

Phone: 1.800.268.6011 or 416.492.2627

<http://www.mhs.com/product.aspx?gr=saf&prod=lsi-r&id=overview>

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## 6.8 Michigan Alcoholism Screening Test (MAST)

### Brief description

The MAST is one of the most widely used measures for assessing alcohol abuse. The instrument is a 25-item questionnaire designed to provide a rapid and effective screening for lifetime alcohol-related problems and alcoholism. The MAST has been productively used in a variety of settings with varied populations.

### Type of administration

- > Pencil-and-paper self-administered
- > Computer self-administered

### Administered by

- > Practitioner or self

### Number of items

- > 25

### Time required for administration

- > 10-15 minutes

### Training required for administration

- > No training required

### Scoring

- > Scoring completed by staff

### Summary of psychometrics (reliability/validity)

The original MAST validation sample of 526 included hospitalized alcoholics, drivers convicted of driving under the influence or who had amassed numerous driving penalty points, persons convicted of drunk and disorderly behaviour, and a control sample (Selzer 1971). Psychometric work includes internal consistency, predictive and concurrent validity, and factor analysis for confirmation of the purported domains.

Early studies showed strong internal consistency (measuring whether several items that propose to measure the same general construct produce similar scores; Cronbach's  $\alpha = .95$ ) but more recent studies suggest a number of items are not highly correlated and that the instrument itself might not be measuring one factor but rather several factors related to problem-drinking (Selzer et al. 1975; Crook et al. 1994; Parsons et al. 1994; Saltstone et al. 1994). Selzer (1971) suggested a cut-off point of 5 to identify harmful or hazardous drinking.

However, a cut-off score of 13 (at which the test has sensitivity of .91 and specificity of .76) is suggested for detecting the presence of alcohol abuse and dependence (Ross et al. 1990).

Reliability and validity data are available across a number of populations; internal consistency ranges from .83 to .95, while test-retest reliability (measures stability of the scores over time) values range from .84 to .97 (Kitchens 1994); lower values are associated with longer delays between administration. The original normative male-only sample covered a wide age range and assessed both clinical and non-clinical populations, and the popularity of the MAST has resulted in data available across numerous special populations, including offender populations (Millson et al. 1995; Swett 1984). Some factor analyses of the MAST have revealed four and six factors (Parsons et al. 1994); the four-factor structure has held across a number of samples, including a female offender population (Saltstone et al. 1994). However, the MAST is generally considered to be a uni-dimensional instrument.

Modifications of the MAST include the 10-item Brief MAST (bMAST), the 13-item Short MAST (SMAST), and the 9-item Malmo modification (Mm-MAST); these briefer instruments would seem perhaps more appropriate for screening purposes than the original 25-item scale. Connor and colleagues (2007) found the bMAST to have good construct validity (the extent to which what was meant to be measured was actually measured) and both single-factor and two-factor scoring were equally effective as the AUDIT in assessing dependence severity. In a recent meta-analysis of the MAST and the SMAST, Shields et al. (2007) found that both the MAST and the SMAST observe moderate to good internal consistency reliability (measuring whether several items that propose to measure the same general construct produce similar scores) estimates. However, in individual assessment and outcome measurement where personal and social costs are considered significant, the MAST and SMAST should be used with caution.

### Limitations

- > Does not discriminate between past and present drinking (Dawe et al. 2002)
- > The MAST has been criticized for its obvious face validity
- > The MAST has little sensitivity to change, as most items are prefaced with "Have you ever...."

### Cost

- > \$40.00 for copy, no fee for use.

### Source and copyright

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## References

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## 6.9 Substance Abuse Subtle Screening Inventory (SASSI)

### Brief description

The SASSI is a brief self-report, easily administered psychological screening measure that is available in separate versions for adults and adolescents. The SASSI was developed out of concern about the potential for distortion of responses on substance abuse measures; the authors of the SASSI claim its resistance to efforts at faking. The SASSI includes both face valid and subtle items that have no apparent relationship to substance use. The subtle

items are included to identify some individuals with alcohol and other drug problems who are unwilling or unable to acknowledge substance misuse or symptoms associated with it. Support materials for the SASSI include user's guides containing easy-to-understand instructions for administering, scoring, and interpretation, and manuals providing comprehensive information on development, reliability, and validity.

Interpretations of the SASSI profiles suggest possible explanations that the clinician may find useful in understanding clients and providing effective feedback. Examples of clinical inferences that may be drawn on the basis of certain scale scores include indication of defensive responding, clients' level of insight and awareness of the effects of their substance misuse, evidence of emotional pain, and relative risk of involvement with the legal/judicial system. In combination with other available assessment information, the clinical inferences suggested by examining SASSI profiles provide ideas for further evaluation and treatment considerations.

### **Type of administration**

- > Pencil-and-paper self-administered
- > Computer self-administered

### **Administered by**

- > Support staff

### **Number of items**

- > 93

### **Time required for administration**

- > 20-30 minutes

### **Training required for administration**

- > No

### **Scoring**

- > Administrator

### **Summary of psychometrics (reliability/validity)**

Allen and Columbus (1995) note the effectiveness of the SASSI in identifying early stage substance abuse in those who have not yet acknowledged their patterns to themselves.

A recent meta-analysis by Feldstein and Miller (2007) found internal consistency (measuring whether several items that propose to measure the same general construct produce similar scores) is high for the overall SASSI and for its direct but not its indirect (subtle) subscales,

suggesting that the instrument taps a single face-valid construct (a property of a test intended to measure something).

SASSI classifications converged with those from other direct screening instruments, and were also correlated with ethnicity, general distress, and social deviance. Studies found test–retest reliability (measures stability of the scores over time) lower than that reported in the test manuals. Sensitivity was found to be similar to that for public domain screening instruments, but on specificity the SASSI appears to yield a high rate of false-positives.

Results from several studies support high internal consistency (measuring whether several items that propose to measure the same general construct produce similar scores) for the direct scales (Myerholtz and Rosenberg 1997, 1998; Clements 2002; Laux et al. 2005; Gray 2001). Additional data from these studies revealed generally lower internal consistency for the SASSI subtle scales, with high variability across samples. For the direct scales, no study reported alpha coefficients as high as those reported in the test manual (Miller and Lazowski 1999).

### Limitations

- > SASSI is quite lengthy
- > Limited literature that includes the SASSI
- > More research is needed to examine the instrument's psychometrics, since it has not been validated for an impaired driving offender population
- > It may be vulnerable to intentional faking

### Cost

- > Starting costs around \$125.00 and up
- > Call for product catalogue or visit the SASSI website

### Source

Source: The SASSI Institute

Phone: 800-726-0526

Website: [www.sassi.com](http://www.sassi.com)

### References

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## 6.10 Research Institute on Addiction Self Inventory (RIASI)

### Brief description

The RIASI was developed for the New York State Drinking Driver Programs. It is a simple screening instrument. The RIASI covers specific risk factors as well as family history associated with alcohol and drugs. The RIASI is designed to screen for alcoholism using “covert content items,” i.e., items which do not directly mention drinking. A training manual is available.

The inventory has three scales, one for detection of individuals with alcohol or other drug problems, a second scale for predicting impaired driving recidivism, and a three-question lie scale. Included are distal measures items, meaning the person cannot readily determine how to fake desirable versus undesirable responses to the question. Also these questions address issues of hostility, sensation-seeking, depression, and other personality characteristics linked to impaired driving.

The RIASI represents a careful and empirical development of a screening device for use with the impaired driving population. Developed specifically for the New York State Drinking Driver Programs, it is now being used in several states.

### **Type of administration**

- > Pencil-and-paper self-administered
- > Interview

### **Administered by**

- > Self or practitioner

### **Number of items**

- > 52

### **Time required for administration**

- > 15-20 minutes

### **Training required for administration**

- > Yes, only basic training needed

### **Scoring**

- > Administered by using a simple transparent overlay

### **Summary of psychometrics (reliability/validity)**

The validity of RIASI has also been confirmed in the convicted drinking driver population in Ontario (Nochajski et al. 1997). In addition to a total score based on all the items on the instrument, Nochajski and colleagues developed a recidivism subscale of 15 items on the instrument that was able to correctly identify over 80% of individuals who were rearrested for drinking driving over a two-year period (Nochajski et al. 1993; Shuggi et al. 2006). Recommended cut-offs for referral of participants to more extensive follow-up were nine on the total score and three on the recidivism scale (Shuggi et al. 2006).

### **Limitations**

- > The authors have been engaged in research that has demonstrated some degree of validity, but more independent research is still needed
- > Does not have the computer automation and summary printout with treatment recommendations

### **Cost**

- > Information on cost and material can be obtained from Thomas Nochajski (see Source)

## Source

Thomas Nochajski, Ph.D.

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## 6.11 Biomarkers

### Brief description

Alcohol biomarkers are physiological indicators of alcohol exposure or ingestion and may reflect the presence of chronic and/or high level of use of alcohol (SAMHSA 2006). Alcohol biomarkers can be used in several ways. The major uses of biomarkers are screening for alcohol problems; motivating change in drinking behaviour; identifying relapse to drinking; evaluating interventions for alcohol problems; and documenting abstinence (SAMHSA 2006; 2012). Alcohol biomarkers are not a substitute for self-report measures found using risk assessments instruments. However, when used in combination with risk assessment instruments, biomarkers can serve as objective measures.

Several biomarkers are considered useful including gamma glutamyl transferase (GGT), carbohydrate deficient transferrin (CDT), phosphatidyl ethanol (PEth), and fatty acid ethyl esters (FAEE). These biomarkers have been investigated and found to have moderate to high diagnostic sensitivity and specificity. There has been increased use of two specific biomarkers (ethyl Glucuronide (EtG) and Ethylsulfate (EtS)), particularly in the United States, which are detectable in urine. These biomarkers are direct metabolites of ethanol alcohol

and have varying levels of sensitivity depending on which biomarker is used. However, it has been emphasized that urine EtG should not be utilized as a quantitative measure of alcohol use, mainly because it is impossible to predict the level of alcohol consumption using urine EtG value. The variable production of EtG can occur as a result of enzyme system variations, urine concentration variations, the amount of time since the last drink, the rate of alcohol consumption, and chronic drinking.

For this reason, in 2012 the Center for Substance Abuse Treatment (CSAT) of the Substance Abuse and Mental Health Services Administration (SAMHSA) in the U.S. issued an updated advisory ([http://kap.samhsa.gov/products/manuals/advisory/pdfs/Advisory\\_Biomarkers\\_Revision.pdf](http://kap.samhsa.gov/products/manuals/advisory/pdfs/Advisory_Biomarkers_Revision.pdf)) that cautions against the interpretation and use of EtG results alone to assess alcohol use. While it is recognized that the higher the EtG level, the more likely it is that drinking occurred; no clear cut-off values have been identified.

### **Type of administration**

- Alcohol biomarkers used to indicate impaired driving risk include samples of blood, urine, hair, and saliva.

### **Administered by**

- Technicians obtain and analyze specific biomarkers using empirically determined cut points.

### **Number of items**

- N/A

### **Time required for administration**

- Varies depending on which sample (blood, urine, hair, or saliva) is used.

### **Training required for administration**

- Varies depending on which sample (blood, urine, hair, or saliva) is used.

### **Scoring**

- Testing of the samples is analyzed using a clinical chemistry instrument within a laboratory.

### **Summary of psychometrics (reliability/validity)**

The findings of Couture et al. (2010) suggest that biomarkers of chronic patterns of heavy drinking may not be adequate to capture the multiple processes that appear to promote recidivism (e.g., binge drinking, other risky behavioural and personality features). Despite their objectivity, caution is warranted in the interpretation of a positive score on these biomarkers in an impaired driving assessment. This study found that alcohol biomarkers failed to

differentiate groups (first vs. recidivists), which is inconsistent with earlier findings by Caviola et al. (2003) and McMillen et al. (1992). However, the current study used a community-based sample whereas other studies used offender populations. Consideration of multiple biomarkers simultaneously did not significantly enhance prediction of recidivism status. A recent population-based study demonstrated that 88% of self-reported alcohol-impaired driving episodes involved binge drinking (e.g., for men an episode of five or more drinks) while 84% of the alcohol-impaired drivers were binge drinkers (Flowers et al. 2008). The results of the Couture study converge with other evidence that questions the emphasis on addiction approaches to impaired driving and its prevention for all offenders.

### Limitations

- Biomarkers provide an important indication of drinking status when used appropriately, but they must be used with a clear understanding of their strengths and potential weaknesses (SAMHSA 2006; 2012). Specific issues to be cognizant of are:
  - » Understanding the difference between a test's sensitivity and positive predictive value;
  - » Potential sources of false-positives;
  - » High costs associated with testing and analyses;
  - » High state of flux with new markers being discovered each year; and,
  - » Many biomarkers are only detectible for relative short windows of time, meaning that the recovery time to normal levels is limited (i.e., 3 to 5 days up to 4 to 6 weeks). As such, the usefulness of biomarkers to detect alcohol consumption requires frequent testing following drinking events.

### Cost

- Varies depending on which sample (blood, urine, hair, or saliva) is used.

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## 6.12 Summary

There are many impaired driver assessment instruments that are available and utilized across North America. Yet not all of these instruments have been validated on an impaired driver population and few have undergone rigorous or independent evaluation efforts. It is for this reason that many jurisdictions rely upon a combination of these instruments to guide the assessment process.

It is essential to underscore that problem substance use behaviour in and of itself is not the source or cause of persistent impaired driving behaviour, but instead merely a correlate of it. So while assessment instruments designed to identify the likelihood of relapse among substance using and even impaired driving populations provide valuable information, these tools frequently overlook the role of criminogenic and socio-psychological factors that are important contributors to chronic offending.

Of the available risk assessment instruments to date, both the LSI-R and ASUS<sup>2</sup> instruments appear to be the most well-grounded in theory and based upon a solid theoretical foundation. These instruments incorporate a range of recognized concepts stemming from several relevant disciplines including criminology, psychology, sociology and addictions, and these concepts have been repeatedly tested and validated through extensive research. Such a comprehensive approach is essential in light of the well-documented complexity associated with impaired driving behaviour and the diversity of underlying processes that have been used to explain persistent offending by this population. It should be underscored that assessment approaches that are multi-trait and multi-method provide more accurate results (Campbell and Fiske 1959).

Looking forward, there is some clear direction as to ways to strengthen research that can guide the development of empirically-based risk assessment instruments. First, with regard to the evaluation of risk assessment instruments, Brown and Ouimet (2013) underscore that

2 The Adult Substance Use Survey (ASUS) is a self-report survey that consists of 64 items designed to assess an individual's perceived alcohol and drug use. The survey also provides a brief mental health screen. It can either be self-administered (paper-and-pencil) or administered orally by a practitioner. Unlike the ASUDS-R, this screening instrument is not specific to an impaired driving offender population although both tools were developed by the Center for Addiction Research and Evaluation (CARE).

“Longer duration perspective evaluations of assessment protocols for prediction of recidivism are urgently needed” (p.311). Second, the research undertaken by Dugosh et al. (2013) provides a basis to begin to integrate criminological theories and empirically-based risk factors to enhance risk assessment tools for impaired drivers. The inclusion of these factors in risk assessment tools can help to strengthen the internal validity of such tools.

*This document is an extracted chapter from the 'Impaired Driving Risk Assessment: A Primer for Practitioners' publication. The full report as well as a complete reference list are available online at [www.tirf.ca](http://www.tirf.ca). You may also download directly the executive summary or any other chapters of the full report.*

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