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CLINICAL PSYCHOLOGY & NEUROPSYCHOLOGY | REVIEW ARTICLE

Identification and evaluation of neuropsychological tools used in the assessment of alcohol-related brain damage: A systematic review protocol

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Abstract: Neuropsychological assessment forms an essential part of the screening, diagnosis and general assessment of Alcohol-Related Brain Damage (ARBD). A number of studies have evaluated the applicability of various neuropsychological tests within the context of ARBD assessment, yet little attempt has been made to collate this evidence and discuss its clinical application. The aim of this protocol is to outline the methodology for a systematic review that aims to identify the neuropsychological tools being used to assess cognitive impairments in individuals with ARBD and evaluate their efficacy within this context. We will search a number of online databases and other sources to identify studies using a neuropsychological tool in the screening, diagnosis or neuropsychological assessment of individuals with ARBD. Primary outcome measures of interest will be construct validity, convergent validity, reliability (retest and inter-rater), sensitivity, specificity, positive predictive value and practical considerations. Results from the review will assist clinicians and researchers involved in the assessment and diagnosis of ARBD by providing a synthesis and critical analysis of the evidence base for each tool, allowing them to make efficient and well-informed test selections. Review findings could also be used to inform the development of guidelines for ARBD diagnosis and assessment.

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PUBLIC INTEREST STATEMENT

Alcohol-Related Brain Damage (ARBD) is associated with a wide range of cognitive problems, such as memory loss and concentration difficulties. As a result, it is important to understand the most effective ways of assessing cognitive impairment in this population. In the present article, we outline the methodology to be used for a systematic review of the literature focusing on cognitive assessment of ARBD. The aim of the review will be to identify and critically evaluate the tools used in this context and therefore assist clinicians and researchers in making well-informed tool selections. The purpose of this protocol is to increase transparency in the methods used for the systematic review and allow readers to judge the appropriateness of any modifications made during the review process. Each methodological stage of the planned review is outlined in detail, along with the specific reviewers involved in each phase.

Subjects: Addiction-Alcohol-Adult; Mental Health; Neuroscience; Psychological Science

Keywords: alcohol-related brain damage; Korsakoff's syndrome; alcohol-related dementia; neuropsychological assessment; diagnosis; screening; cognitive impairment; psychometric

1. Background

It is now well established that cognitive dysfunction is a sequel of long-term excessive alcohol consumption (Brion, Pitel, Beaunieux, & Maurage, 2014; Harper, 2009; Oscar-Berman, 2012). Previously, the harmful effects of alcohol on the brain have been divided into distinct conditions including Wernicke's encephalopathy (WE), Korsakoff's syndrome (KS) and alcohol-related dementia (ARD). However, in order to reflect the heterogeneity in the presentation of alcohol-related disorders of cognition, the term alcohol-related brain damage (ARBD) has been used recently as an umbrella term to encompass the broad spectrum of brain damage associated with chronic alcohol consumption (Ridley, Draper, & Withall, 2013). ARBD has been defined as a neuropsychiatric disorder characterised by profound cognitive dysfunction linked to excessive alcohol consumption and allied thiamine (vitamin B1) deficiency, and includes WE, KS and ARD (Royal College of Psychiatrists, 2014).

While issues remain surrounding the nosology of ARBD (Ridley et al., 2013), impaired cognitive function represents a pervasive and debilitating feature of the disorder in all its presentations. Individuals with ARBD display impairments in episodic, semantic and implicit memory processes (Kopelman et al., 2009; Race & Verfaellie, 2012; Van Tilborg, Kessels, Kruijt, Wester, & Hulstijn, 2011) as well as deficits in executive functioning (Maharasingam, Macniven, & Mason, 2013; Van Oort & Kessels, 2009). As a corollary of this, neuropsychological assessment forms a vital part of the screening, diagnosis and general assessment of the condition (Kopelman, Thomson, Guerrini, & Marshall, 2009; Wester, Westhoff, Kessels, & Egger, 2013).

For individuals with ARBD, neuropsychological assessment enables an understanding of both the nature and degree of cognitive impairment, as well as the functional implications of this (MacRae & Cox, 2003; Royal College of Psychiatrists, 2014). The outcomes of neuropsychological testing also have valuable implications for the selection of appropriate rehabilitation programmes and interventions for individuals with brain damage (Vakil, 2012). Finally, assessments of cognitive function in those with ARBD may also provide useful measures of progress in response to treatment (Smith & Hillman, 1999). Yet, despite its cardinal role, current UK clinical guidelines (e.g. National Institute for Health & Clinical Excellence, 2011) offer no guidance on the neuropsychological assessment of ARBD. What is more, no standardised assessment battery exists for assessing cognitive impairment in individuals with ARBD, thus clinicians are reliant on non-specific measures.

The Royal College of Psychiatrists (2014) recommend the use of instruments such as the Montreal Cognitive Assessment, MoCA (Nasreddine et al., 2005) or the Addenbrook's Cognitive Examination (Hsieh, Schubert, Hoon, Mioshi, & Hodges, 2013) to assess cognitive impairments in those with a history of long-term alcohol consumption. Others have suggested the Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) brief screening tool may be useful in hospital settings for measuring general cognitive function, though the tool's limited ability to assess memory function is recognised (Kopelman et al., 2009). Extant research has examined the psychometric and practical merits of neuropsychological tools such as MoCA, MMSE and others in assessing alcohol-related cognitive impairment (e.g. Oudman et al., 2014; Wester, van Herten, Egger, & Kessels, 2013), yet little attempt has been made to systematically collate and discuss the clinical application of this research. From a clinical perspective, this makes comparing the evidence base for each neuropsychological tool difficult, complicating appropriate and prompt selection.

We outline a protocol here for a systematic review which will expand upon the understanding of the neuropsychological tools currently used in the assessment of ARBD and the efficacy of the identified tools in terms of assessing cognitive impairments in this population. Through an evidence-based critical evaluation of the identified measures, our findings will be of benefit to clinicians and

researchers involved in the neuropsychological assessment of ARBD. Findings will also be of use from a health policy perspective, potentially informing the development of guidelines on the assessment of the condition.

A similar review study has been published recently which systematically searched the literature relating to the comprehensive assessment of ARBD (including neuropsychological assessment; Horton, Duffy, Hollins Martin, & Martin, 2015), though further investigation is required for several reasons. Firstly, although published in 2015, Horton and colleagues conducted their literature search in June 2013. Since this time a number of studies have been published examining the psychometric properties of neuropsychological tools in the assessment of ARBD (e.g. Oudman et al., 2014; Wester, Roelofs, Egger, & Kessels, 2014). According to Horton and colleagues this form of study was scant at the time of their search, limiting their discussion. In addition, the review by Horton et al. contains several methodological and reporting weaknesses. Firstly, the authors do not report working from a protocol or registering the review methodology with an online database such as PROSPERO, making it difficult to establish the risk of bias involved in the review. Secondly, according to our preliminary literature search, Horton and colleagues appear to have missed several studies relating to neuropsychological assessment which—according to their reported criteria—appear eligible for inclusion in their review (e.g. Borsutzky, Fujiwara, Brand, & Markowitsch, 2008; Crawford, Parker, & Besson, 1988). This is a particular issue as many of the relevant studies absent from Horton et al.'s review comment on the clinical efficacy of the assessments used (e.g. Brokate et al., 2003; O'Carroll, Moffoot, Ebmeier, & Goodwin, 1992). Thirdly, the authors only included studies with KS participants, excluding studies assessing ARD and ARBD and therefore omitting a significant body of valuable information regarding the neuropsychological assessment of ARBD. What is more, the authors stated in their inclusion criteria that they would only include participants diagnosed according to criteria outlined in the Diagnostic Statistical Manual-IV or the International Classification of Diseases-10, yet their included studies do not meet this criteria—suggesting inconsistencies between the reported methods and those employed in the review. Finally, their synthesis is largely descriptive, lacks critical evaluation of the neuropsychological tools and studies identified, and offers little advice on the clinical application of findings.

Combined, the issues with Horton and colleagues' (2015) review potentially bias their conclusions and restrict their clinical application. It is anticipated that a more thorough review of the literature in this area, including studies focusing on participants with ARD and ARBD, would result in a review of substantially more studies (n = > 70) than the 17 included by Horton and colleagues. Consequently, further investigation of the literature on neuropsychological assessment of ARBD is warranted in order to provide a more comprehensive and contemporary understanding of both the tools used and their clinical utility.

1.1. Objectives

The planned review has two primary aims:

(1) To systematically review the literature to identify the neuropsychological tools used in the screening, diagnosis and neuropsychological assessment of ARBD.

(2) To evaluate the diagnostic, psychometric and practical merits of identified tools within the assessment of this population.

2. Methods

2.1. Protocol

In developing this protocol we consulted guidance on the conduct and reporting of protocols and narrative synthesis for systematic reviews, including the PRISMA-P guidelines (Moher et al., 2015), the PRISMA-P elaboration and explanation paper (Shamseer et al., 2015) and guidance on narrative synthesis provided by the Centre for Reviews and Dissemination (2009) and Popay et al. (2006). The

protocol is registered with the PROSPERO International Prospective Register of Systematic Reviews (Registration No. CRD42015030209).

2.2. Eligibility criteria

Studies will be selected according to the following predefined criteria.

2.2.1. Types of study design

We will include studies focusing on the neuropsychological assessment of ARBD and those using neuropsychological tools in the screening or diagnosis of the condition. Studies of interest include, but will not be restricted to, screening and diagnostic studies, cross-sectional and observational research, epidemiology or prevalence studies, and case studies. Randomised control trials and treatment studies will not be included as we have identified that these studies are less likely to comment on the psychometric or diagnostic properties of the tools used. Review studies will not be included. We will not apply any date or minimum sample size restrictions. Studies will not be confined to any geographical region. Only studies published in English and those in other languages that can be adequately translated to English using an online document translator will be included in the review. Both published and ongoing studies will be considered.

2.2.2. Types of participants/population

Included studies will focus on adult (18 years and older) human participants. Participants of interest are those being assessed for, or already diagnosed with, KS, ARD or ARBD. We will not include studies assessing cognitive impairment in WE participants due to the increased risk of alcohol intoxication obscuring performance on neuropsychological tests. Research focusing on KS participants who have developed the condition through non-alcohol-related means (such as non-alcohol associated thiamine depletion) will not be included. We will include studies where ARBD participants are assessed alongside controls, non-ARBD alcohol users and other clinical populations (e.g. those with dementia).

2.2.3. Types of assessments

Neuropsychological tools are defined as normatively-informed performance-based methods of measuring cognitive function (Harvey, 2012). Included studies will use at least one standardised neuropsychological assessment. Studies using only non-standardised neuropsychological measures will not be included. Neuropsychological tools may include brief screening measures, psychometric instruments, intelligence tests or computer-based cognitive assessments. Tools must be used to assess cognitive impairment in individuals with ARBD or suspected ARBD as a form of screening, diagnosis or general assessment.

2.2.4. Types of outcome measures

We have consulted relevant research and guidance on the methodological and psychometric principles of neuropsychological testing (Pawlowski, Segabinazi, Wagner, & Bandeira, 2013; Strauss, Sherman, & Spreen, 2006; Willmes, 2010) and diagnostic measures (Parikh, Mathai, Parikh, Chandra Sekhar, & Thomas, 2008) in order to select a number of metrics as outcome measures. All primary and secondary outcome measures of interest and their definition are presented in Table 1. However, based on a preliminary search of the literature we have identified that many relevant studies do not report on these outcomes. Consequently, as we hope to identify the various neuropsychological assessments being used with this population, we will not exclude studies if they do not report on any of our chosen outcome measures.

2.3. Information sources

We will search the following bibliographical databases: MEDLINE, Psych INFO, EMBASE, Science Direct, ProQuest Psychology Journals and Google Scholar. The reference lists of all included articles and of relevant reviews (e.g. Horton et al., 2015) will be searched for suitable studies. We will also engage in forward citation searches whereby articles which have cited our included studies will be identified and screened for relevance. To identify any relevant unpublished and/or ongoing studies

Table 1. Outcome measures of interest

	Outcome measure	Definition
Primary outcomes	Construct validity	Also known simply as "validity" or "test validity", construct validity refers to the degree to which a test measures what it purports to measure
	Convergent validity	A subset of construct validity (along with divergent validity) that refers to the degree to which scores on two different measures, which are theoretically assessing the same construct, correlate
	Inter-rater reliability	The correlation or consistency between the administration and scoring of the same test by two different examiners
	Test–retest reliability	Also known as "temporal reliability", test–retest reliability refers to the correlation or consistency between scores for the same test administered at two points in time
	Sensitivity & specificity	Sensitivity: The ability of a test to correctly identify individuals with the condition of interest as impaired (i.e. true positives)
		Specificity: The ability of a test to correctly identify individuals without the condition of interest as not impaired (i.e. true negatives)
		Calculating sensitivity: True positive/true positive + false negative
		Calculating specificity: True negative/true negative + false positive
	Positive predictive value	The percentage of persons classed as impaired by a test who actually have the condition of interest
		Calculating positive predictive value: True positive/ true positive + false positive
	Practical considerations	Refers to any practical factor which may affect the administration of the test, such as administration time, ease of administration, physical or psychological requirements of testing or cultural barriers to testing
Secondary outcomes	Content validity	The extent to which a test measures all aspects of the construct it purports to and all items/questions are relevant to that construct
	Face validity	A face value, qualitative interpretation of the degree to which the test appears to measure the construct it aims to
	Ecological validity	The extent to which test scores are indicative of real life functioning (e.g. the degree to which scores on a test of learning reflects the person's ability to learn new information in day-to-day life)

we will also contact academic and clinical experts within the field and search related grant council websites (e.g. Alcohol Research UK). We will not search clinical trial registers as research included within these databases is likely to focus on intervention efficacy as opposed to diagnosis or neuropsychological assessment. Lastly, the complete list of included studies will be circulated to all authors to ensure all relevant literature is identified.

2.4. Search strategy

A draft search strategy was developed by all authors and subsequently peer-reviewed by the Specialist Unit for Review Evidence (SURE), a team of information specialist and systematic reviewers with experience of designing and reviewing search strategies for systematic reviews. Separate search strategies will be employed for KS, ARD and ARBD. The review team has consulted Emtree and MeSH thesauruses, nosological systems, and engaged in group discussion to identify all relevant terms for each condition (e.g. "Korsakoff's Syndrome, Korsakoff, Alcohol amnestic disorder") and terms to identify studies relating to neuropsychological assessment (e.g. "screening", "psychometric assessment", "cognitive impairment", "executive function"). Terms for each condition will be

combined with those relating to neuropsychological assessment using the Boolean operator "AND". Language and publication date restrictions will not be applied. Treatment and review studies will be excluded from searches when possible. An example search strategy for KS-related evidence in the MEDLINE via EBSCO database can be found in Appendix 1. Strategies will be adapted for each database according to their syntax codes and specificities.

2.5. Data management and selection process

The references and abstracts of all potentially relevant studies returned from the search strategy will be imported to EndNote reference management programme for duplicate removal. Following this, studies will be uploaded to Covidence, an online software program designed specifically for collating and screening studies for systematic reviews. RH and GR-D will screen references and abstracts via Covidence for relevance against two preliminary criteria:

(1) The study participants are human adults (18 years or over)
(2) The study uses, or appears to use, a neuropsychological tool to assess cognitive impairments associated with ARBD.

Full-text reports will be obtained for all studies which appear to meet the above criteria and for those which need further consideration before their inclusion or exclusion. Prior to screening full-text reports, authors RH and GR-D will engage in a calibration process to enhance inter-reviewer consistency—screening 25 randomly selected studies. A Kappa statistic will be used to quantify agreement between researchers, with the aim of achieving a statistic >0.6 prior to beginning study selection (Viera & Garrett, 2005). RH and GR-D will then independently screen studies for eligibility via Covidence. Where necessary, additional information may be sought from study authors to facilitate decisions on study relevance. The rationale for all full-text exclusions will be documented using Covidence. Any disagreements arising from either phase of the selection process will be decided by authors BJ and PR. A PRISMA flow chart will be completed to display the process of study selection.

2.6. Data extraction

The abstraction of data from included studies will be carried out independently in duplicate by two authors (RH and BJ). This process will be guided by an extraction table designed by the authors according to the specific aims of the review (*see* Additional file 2 *for extraction table*). Prior to extraction RH and BJ will independently pilot test the extraction table using five randomly selected included studies, subsequently reconvening to discuss the table's comprehensiveness and consistency between reviewers. Disagreements arising from the extraction process will first be solved through discussion, then, if unresolved, via a third reviewer (GR or PR). In the event of missing or unclear data we will contact study authors to obtain further information.

We will abstract the following study details: authors, title, year, geographical region, study design, participant characteristics (sample size, age, gender, disease status, details of control and other groups), the neuropsychological assessment tool/s used and details of administration, any reference standard test used and any other assessment used concomitantly (e.g. alcohol screening tools). All quantitative and narrative data relating to the primary outcome measures of construct validity, convergent validity, test–retest and inter-rater reliability, sensitivity, specificity, positive predictive value and practical considerations will be abstracted. Any quantitative and narrative data authors provide regarding the secondary outcomes of content, face or ecological validity of tools will also be recorded. The definitions of all primary and secondary outcomes are included in the data extraction form to ensure consistency between reviewers.

2.7. Quality assessment

Following an examination of existing standardised quality appraisal checklists, such as those provided by the Critical Appraisal Skills Program or the QUADAS-2 diagnostic study checklist (Whiting et al., 2011), it was determined that no existing quality appraisal form met the specific requirements of

Table 2. Quality assessment checklist

Question		Response
1.	Was a sufficient period of abstinence (i.e. preferably >2 months but a minimum of >6 weeks) achieved prior to assessment?	Yes/Can't tell/No
2.	Are participants diagnosed in accordance with (or already diagnosed using) the criteria outlined in nosological systems (DSM or ICD) or other accepted diagnostic criteria (e.g. Oslin & Cary, 2003)?	Yes/Can't tell/No
3.	Is a diagnosis of ARBD confirmed using an appropriate reference standard* prior to or following neuropsychological assessment?	Yes/Can't tell/No
4.	Is the disease status of the participants clearly described? (*Including comorbidities such as depression & anxiety)*	Yes/Can't tell/No
5.	Were persons with confounding conditions such as traumatic brain injuries or dementia excluded?	Yes/Can't tell/No
6.	Was pre-morbid intelligence# taken into consideration when determining level of impairment?	Yes/Can't tell/No/Not appropriate
7.	Are the neuropsychological tools used specific to the language and culture of the population tested?	Yes/Can't tell/No

Note: All questions to be answered in relation to the sample/s of focus (i.e. those with/being tested for ARBD).

*We define a reference standard for ARBD as a multifaceted approach to diagnosis involving at least two of the following: Comprehensive neuropsychological assessment, a review of medical history, clinical assessment, neuroimaging investigation.

#Estimations of pre-morbid intelligence may be achieved through specific neuropsychological tests known to be relatively immune to neurological damage (e.g. subscales of the Wechsler Adult Intelligence Scale IV; Wechsler, 2008) or via the collection of relevant demographic information (e.g. years of education and vocational achievement; Vakil, 2012).

this review. Consequently, we have developed a checklist specifically for critically appraising studies using neuropsychological tools in the assessment ARBD (Table 2). In developing the checklist we consulted existing appraisal forms and guidance on factors which could potentially render the results of neuropsychological testing invalid (Evans, 2010).

The appraisal of studies using the checklist will be carried out independently by two review authors (RH and BJ). Any disagreement will be resolved firstly through discussion, then through mediation by a third reviewer (GR-D or PR) if unresolved. Although we plan to assess the quality of evidence, we will not exclude studies of poor quality from the data synthesis. We wish to include all relevant studies using neuropsychological tools in the assessment of ARBD in order to enhance the knowledge of the specific measures used and to assess their merit within this context. Nonetheless, we believe a measure of study rigour will be useful for the readers of the report in determining the quality of studies included. The results of the critical appraisal process will be displayed in tabular form and made available for readers of the final report. We will consider the impact of study quality on the strength of our findings.

2.8. Data synthesis

Based on the expected heterogeneity between studies and outcome measures, it is not expected that a meta-analysis will be appropriate for synthesising data from included studies. Therefore, a systematic narrative synthesis of findings will be provided. We have consulted guidance on narrative synthesis provided by Popay et al. (2006) who propose four key features of narrative synthesis: [1] developing a theory of how the intervention works, why and for whom, [2] developing a preliminary synthesis of findings in included studies, [3] exploring relationships in the data, and [4] assessing the robustness of the evidence. As our systematic review will focus on evaluating the efficacy of assessment tools, as opposed to the efficacy of an intervention, we anticipate using only the latter three features to inform our narrative synthesis.

We will structure the review findings around the eight primary outcome measures: [1] construct validity, [2] convergent validity, [3] test–retest reliability, [4] inter-rater reliability [5, 6], sensitivity

and specificity, [7] positive predictive value, and [8] practical considerations. We will also discuss additional findings relating to the content, face or ecological validity of tools, as well as the clinical application of findings. Finally, we will discuss the robustness of the evidence and the synthesis as per Popay and colleagues (2006) suggestions. Tables will also be used to support the data synthesis. The first table presented will display the details of all identified assessment tools (e.g. author, cognitive domains assessed, format, diagnostic cut-off scores). A second table will present study findings relating to the validity, reliability, sensitivity and specificity statistics of each tool.

2.9. Amendments

If during the process of the systematic review any amendments are made to the methodology outlined in this protocol they will be recorded along with the date and the rationale. Any proposed methodological changes will be approved by all authors, with RH being responsible for documenting the process. Changes to the protocol methodology will be added to the PROSPERO registration and made available for readers of the final report. Changes will not be incorporated into the protocol.

3. Discussion

Alcohol-related brain damage is associated with a wide range of cognitive deficits. Accordingly, neuropsychological assessment represents a key feature of the screening, diagnosis and general assessment of the disorder. This systematic review will provide a synthesis of studies using neuropsychological instruments to assess cognitive impairment in individuals with ARBD, enhancing knowledge of the tools currently used. It will also critically evaluate the identified tools using a framework comprised of a number of pre-defined metrics. To our knowledge, this will be the first systematic review to specifically focus on the identification and evaluation of neuropsychological tools used with this population.

The present review will update and expand upon the existing review conducted by Horton et al. (2015) in several ways. Firstly, we will review studies focusing on participants with ARBD and ARD as well as KS, providing a novel synthesis and evaluation of the literature focusing on these populations. Secondly, screening and diagnostic studies, which were excluded by Horton and colleagues, will be included in the review in order to evaluate the use of specific neuropsychological tests within this context. Thirdly, we will employ a more thorough search strategy in order to identify relevant texts not included within the review by Horton et al. (2015). Overall, the current review will provide a more thorough and comprehensive investigation of the literature surrounding the neuropsychological assessment of ARBD than that of Horton et al. (2015).

The findings of the review will be of benefit to clinicians and researchers involved in the neuropsychological assessment of ABRD, providing a synthesis of the evidence underpinning the use of specific neuropsychological tools within various capacities, including diagnosis and the assessment of memory and executive function deficits. As stated by Strauss et al. (2006), identifying and critically reviewing the vast amount of literature pertaining to each neuropsychological test presents an almost impossible task for modern neuropsychologists. Thus, the findings of our review will enable clinicians and researchers to make informed, evidence-based decisions when selecting appropriate tests for ARBD assessment, without the time investment required to review the literature themselves. Our findings will also highlight gaps in the existing literature and directions for future research. Finally, findings could also be used to inform the development of guidelines and policy relating to the assessment of ARBD.

Supplementary Material
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Competing Interests
The authors declare no competing interest.

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Authors' contributions
RH is the guarantor. RH, BJ and GR-D conceived of the study and designed the protocol. PR contributed to further refinement of the protocol and provided clinical expertise on ARBD and associated cognitive impairments. RH drafted the manuscript. All authors reviewed, gave feedback and approved the final manuscript.

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Appendix 1.

Example search strategy for MEDLINE via EBSCO

(1) MEDLINE: TX ("Korsakoff's Syndrome" or Korsakoff* or "Alcohol amnes* disorder" or "Alcohol-induced amnestic disorder" or "Alcohol-induced persisting amnestic disorder") AND TX (Neuropsychological [assess* or tool or evaluat* or screen* or diagnos* or measurement or test* or performance]); 283 results.

(2) MEDLINE: TX ("Korsakoff's Syndrome" or Korsakoff* or "Alcohol amnes* disorder" or "Alcohol-induced amnestic disorder" or "Alcohol-induced persisting amnestic disorder") AND TX (Cognitive [assess* or tool or evaluat* or screen* or diagnos* or measurement or test* or performance]); 69 results.

(3) MEDLINE: TX ("Korsakoff's Syndrome" or Korsakoff* or "Alcohol amnes* disorder" or "Alcohol-induced amnestic disorder" or "Alcohol-induced persisting amnestic disorder") AND TX

(Psychometric [assess* or tool or evaluat* or screen* or diagnos* or measurement or test* or performance]); 11 results.

(4) MEDLINE: TX ("Korsakoff's Syndrome" or Korsakoff* or "Alcohol amnes* disorder" or "Alcohol-induced amnestic disorder" or "Alcohol-induced persisting amnestic disorder") AND TX (Assess* or evaluat* or screen*, diagnos* or measurement, test* or performance or prevalence sensitivity or specificity or predict* or validity or reliab* or impair* or memory or executive function* or frontal function* or amnesia* or intelligence or cognit* or dysfunction); 1,193 results.

(5) MEDLINE: TX ("Korsakoff's Syndrome" or Korsakoff* or "Alcohol amnes* disorder" or "Alcohol-induced amnestic disorder" or "Alcohol-induced persisting amnestic disorder") AND TX ("Mini-Mental State Examination" or MMSE or "Rivermead Behavioural Memory Test" or RBMT or RBMT-3 or "Cambridge Neuropsychological Test Automated Battery" or CANTAB or "Addenbrooke's cognitive examination" or ACE or ACE-R or "Montreal Cognitive Assessment" or MoCA or "Behavioural Assessment of the Dysexecutive Syndrome" or BADS or "Repeatable Battery for the Assessment of Neuropsychological Status" or RBANS or "Rey-Osterreith Complex figures task" or ROCF or "Wisconsin Card sorting test" or WCST or "Wechsler adult intelligence scale*" or WAIS* or "Wechsler test of adult reading" or WTAR* Rey Auditory Verbal Learning Test, RAVLT, The Delis-Kaplan Executive Function System, D-KEFS, Wechsler Memory Scale, WMS); 45 results.

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