

This should not discourage health workers from conducting the remaining items of the Clinical Instrument and using this information to supplement their interpretation of AUDIT.

## SCORING AND INTERPRETATION OF AUDIT

An easy-to-use brochure has been designed to guide the interviewer and to assist with scoring and interpretation. This should only be used after becoming thoroughly familiar with the more detailed procedures described below. As indicated by the AUDIT questions shown in **Table 4**, each item is scored by checking the response category that comes closest to the patient's answer.

On the basis of evidence from the validation study (10), two cut off points are suggested, depending on the purpose of the screening programme or the nature of the research project. A score of eight or more produces the highest sensitivity, while a score of ten or more results in higher specificity (see Appendix B). In general, high scores on the first three items in the absence of elevated scores on the remaining items suggest **hazardous** alcohol use. Elevated scores on items 4 through 6 imply the presence or emergence of **alcohol dependence**. High scores on the remaining items suggest **harmful** alcohol use. As discussed in the following section on diagnosis, each of these areas of alcohol-related problems implies different types of management.

The Clinical Screening Instrument, shown in **Table 5**, is considered to be elevated when the total score is five or greater. Here too the examiner should give careful consideration to the different meanings attributed to alcohol-related trauma, physical signs, and the elevated liver enzyme. It should be noted that false positives can occur when the individual is accident prone, uses drugs (such as barbiturates) that induce GGT, or has hand tremor because of nervousness, neurological disorder or nicotine dependence.

### WARNING: AUDIT IS NOT A DIAGNOSTIC INSTRUMENT

- Screening with AUDIT may identify hazardous or harmful drinkers, even alcohol dependent patients, but is not in itself a diagnostic test.
- If identified as a harmful drinker by AUDIT, it is desirable to call for an in-depth diagnostic evaluation by a qualified practitioner.

## DIAGNOSIS, MANAGEMENT AND REFERRAL

Screening in itself is just the first step in a process of identifying, diagnosing and treating a patient. Following the recognition that a patient scores positively on either AUDIT or the Clinical Screening Instrument, a more thorough evaluation should be conducted. This should be conducted by a qualified professional who is familiar with alcohol-related disorders. Typically, the diagnosis of alcohol use disorders is established by evaluating the history of the patient's drinking, the signs and symptoms present, as well as laboratory data such as liver enzyme abnormalities. Health workers using AUDIT should be familiar with the ICD-10 system of classifying alcohol-related disorders (12). They should refer patients for proper evaluation if they do not feel competent to do so themselves. The value of establishing a diagnosis is to provide a logical basis for management or treatment. The flow chart shown in **Figure 3** illustrates the proper sequence of screening, diagnosis and intervention following interpretation of AUDIT results.

Central to the diagnosis of alcohol use disorders in ICD-10 is the concept of a dependence syndrome, which is distinguished from alcohol-related disabilities (12). The dependence syndrome is seen as an interrelated cluster of cognitive, behavioural and physiological symptoms. Alcohol-related disabilities, on the other hand, consist of those physical, psychological and social dysfunctions that follow directly or indirectly from harmful drinking and dependence.

According to the ICD-10 diagnostic system for substance use disorders, a complete description of an individual's alcohol-related pathology must include the nature and severity of dependence, the kinds and degrees

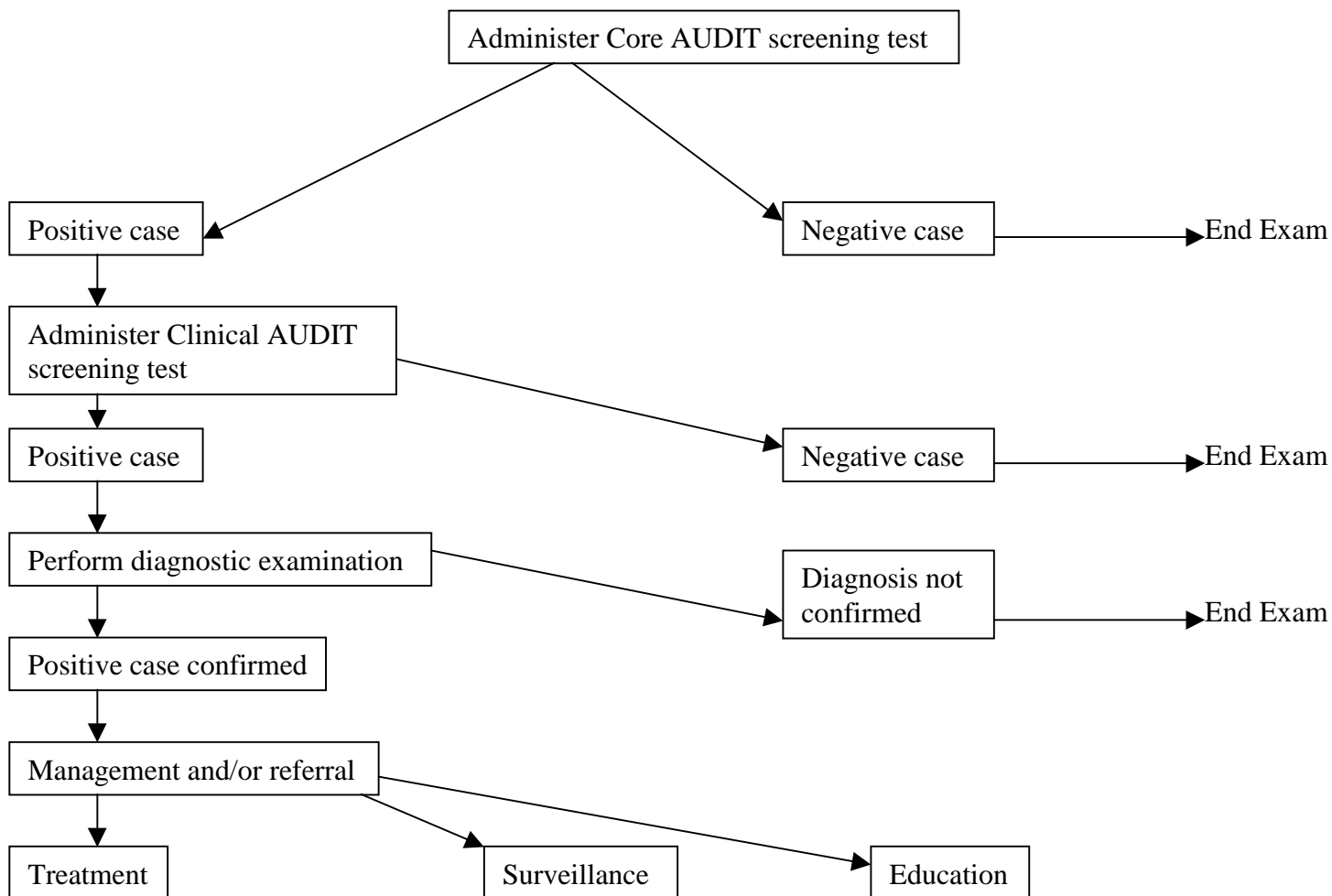
of disability, and the personal and environmental factors that influence the drinking problem.

In part to address the complexity of alcohol-related problems, ICD-10 introduced the term harmful use into the nomenclature. This category is concerned with medical or related types of harm, since the purpose of ICD is to classify diseases, injuries and causes of death.

**Harmful use** is defined as a pattern of use which is already causing damage to health. The damage may be either physical (e.g., liver damage from chronic drinking) or mental (e.g., episodes of depressive disorder secondary to heavy drinking). As with hazardous use, harmful patterns of use are often criticized by others and are sometimes associated with adverse social consequences. However, the fact that drinking is disapproved by the family or culture is not by itself evidence of harmful use.

A diagnosis of **dependence** should only be made if three or more of the following have been experienced or exhibited at some time in the previous twelve months: 1. a physiological withdrawal state; 2. alcohol use with the intention of relieving withdrawal symptoms and with awareness that this strategy is effective; 3. an impaired capacity to control the onset, termination or level of use; 4. a narrowing of the personal repertoire of patterns of use, e.g., a tendency to drink in the same way on weekdays and weekends, regardless of the social constraints; 5. progressive neglect of alternative pleasures or interests in favour of alcohol use; 6. persistence of use despite clear evidence of harmful consequences; 7. evidence of tolerance; and 8. a strong desire or sense of compulsion to take alcohol.

## Flow Chart of Screening, Diagnosis and Intervention Using AUDIT



**Table 4 THE AUDIT QUESTIONNAIRE**

Circle the number that comes closest to the patient's answer.

**1. How often do you have a drink containing alcohol?**

- (0) NEVER (1) MONTHLY OR LESS (2) TWO TO FOUR TIMES A MONTH (3) TWO TO THREE TIMES A WEEK (4) FOUR OR MORE TIMES A WEEK

**2.\* How many drinks containing alcohol do you have on a typical day when you are drinking?  
[CODE NUMBER OF STANDARD DRINKS]**

- (0) 1 OR 2 (1) 3 OR 4 (2) 5 OR 6 (3) 7 OR 8 (4) 10 OR MORE

**3. How often do you have six or more drinks on one occasion?**

- (0) NEVER (1) LESS THAN MONTHLY (2) MONTHLY (3) WEEKLY (4) DAILY OR ALMOST DAILY

**4. How often during the last year have you found that you were not able to stop drinking once you had started?**

- (0) NEVER (1) LESS THAN MONTHLY (2) MONTHLY (3) WEEKLY (4) DAILY OR ALMOST DAILY

**5. How often during the last year have you failed to do what was normally expected from you because of drinking?**

- (0) NEVER (1) LESS THAN MONTHLY (2) MONTHLY (3) WEEKLY (4) DAILY OR ALMOST DAILY

**6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?**

- (0) NEVER (1) LESS THAN MONTHLY (2) MONTHLY (3) WEEKLY (4) DAILY OR ALMOST DAILY

**7. How often during the last year have you had a feeling of guilt or remorse after drinking?**

- (0) NEVER (1) LESS THAN MONTHLY (2) MONTHLY (3) WEEKLY (4) DAILY OR ALMOST DAILY

**8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?**

- (0) NEVER (1) LESS THAN MONTHLY (2) MONTHLY (3) WEEKLY (4) DAILY OR ALMOST DAILY

**9. Have you or someone else been injured as a result of your drinking**

- (0) NO (2) YES, BUT NOT IN THE LAST YEAR (4) YES, DURING THE LAST YEAR

**10. Has a relative or friend or doctor or other health worker been concerned about your drinking or suggested you cut down?**

- (0) NO (2) YES, BUT NOT IN THE LAST YEAR (4) YES, DURING THE LAST YEAR

\* In determining the response categories it has been assumed that one "drink" contains 10g alcohol. In countries where the alcohol content of a standard drink differs by more than 25% from 10g, the response category should be modified accordingly.

Record sum of individual item scores here \_\_\_\_\_ .

**Table 5**

**AUDIT “CLINICAL” QUESTIONS AND PROCEDURE**

**Trauma History**

1. **Have you injured your head since your eighteenth birthday?**

(3) YES (0) NO

2. **Have you broken any bones since your eighteenth birthday?**

(3) YES (0) NO

**Clinical Examination**

3. **Conjunctival injection**

(0) NOT PRESENT (1) MILD (2) MODERATE (3) SEVERE

4. **Abnormal skin vascularisation**

(0) NOT PRESENT (1) MILD (2) MODERATE (3) SEVERE

5. **Hand tremor**

(0) NOT PRESENT (1) MILD (2) MODERATE (3) SEVERE

6. **Tongue tremor**

(0) NOT PRESENT (1) MILD (2) MODERATE (3) SEVERE

7. **Hepatomegaly**

(0) NOT PRESENT (1) MILD (2) MODERATE (3) SEVERE

8. **GGT Values\***

Lower normal ( 0 - 30 IU/l) = (0)  
Upper normal (30 - 50 IU/l) = (1)  
Abnormal (50 IU/l) = (3)

\* These values may change with laboratory methods, and standards may vary with sex and age of the drinker.

Record sum of individual scores here \_\_\_\_\_.

A related concept, not included in ICD-10, but nevertheless important to screening, is hazardous use (13). **Hazardous use** is defined as an established pattern of use carrying with it a high risk of future damage to health, physical or mental, but which has not yet resulted in significant medical or psychiatric ill effects. Hazardous patterns of use are often criticized and disapproved by other people, and sometimes result in social consequences such as domestic conflicts, financial difficulties and marital breakdown. However, the fact that use of alcohol, or the individual's pattern of use, is disapproved by his or her family or culture is not by itself evidence of hazardous use; nor is the fact that it may have led to social problems such as driving under the influence of alcohol. High risk of future damage to health is, therefore, crucial to the concept of hazardous use. In assessing the extent of that risk, the scale and pattern of use, as well as other factors such as family history, should be taken into account.

Following diagnosis of hazardous use, harmful use, alcohol dependence syndrome, or other alcohol-related disabilities, a variety of options are available to the primary health care worker. In less serious cases, the health worker should consider practising some of the secondary prevention and brief intervention strategies that have been developed for use in demonstration programmes and research evaluation studies (1,3). These include simple advice, brief counselling, information giving, self-help manuals, and periodic monitoring of progress. In more serious cases, the patient should be referred to local professionals with expertise in alcohol problems or specialized health care facilities, if these are available.

**Summary: WHAT TO DO WITH POSITIVE CASES ON AUDIT**

- Use the clinical screening instrument if not previously used.
- Confirm or rule out diagnosis of alcohol dependence.
- Refer patient for treatment, surveillance or health education programme as appropriate.

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## APPENDIX A: Research Guidelines for AUDIT

Although AUDIT was developed on the basis of an extensive six-nation validation trial, additional research is necessary to evaluate its accuracy and utility in different settings, populations and cultural groups. To guide this process, it is recommended that health researchers use AUDIT to answer some of the following questions:

1. Does AUDIT correlate with external sources of information about hazardous use, harmful use and alcohol dependence, which are measured at the same time? This is termed “concurrent” validity. External sources of information that should be considered in relation to the core and clinical versions of AUDIT include: a) Self-report measures of alcohol consumption, dependence symptoms and alcohol-related problems; b) biochemical tests known to be sensitive to alcohol consumption, or to be markers of damage resulting from chronic drinking; c) observational evaluations of alcohol consumption, dependence symptoms, and alcohol-related problems provided by family members, friends or other observers; d) public and hospital records of alcohol-related problems such as police reports and medical records.

2. Does AUDIT discriminate between persons who do or do not exhibit various alcohol-related behaviours and disease conditions? Discriminant validity can be evaluated by comparing AUDIT scores obtained from known groups such as abstainers, infrequent drinkers, formerly alcohol-dependent persons, as well as current drinkers who meet ICD-10 criteria for hazardous use, harmful use and alcohol dependence syndrome. The demands of methodologically sound validation require the use of independent diagnostic criteria, which themselves have been validated. Two instruments that may be useful for this purpose are the Composite International Diagnostic Interview (CIDI) and the Structured Clinical Assessment for Neuropsychiatry (SCAN). Both of these interviews provide independent verification of a variety of alcohol use disorders according to ICD-10 and other diagnostic systems.

3. Does AUDIT predict future alcohol problems as well as treatment response? This can be evaluated by conducting repeated AUDITs on the same individuals. Total scores can be correlated with various indicators of future symptomatology. It would be desirable to know, for example, whether AUDIT assesses alcohol-related problems along a continuum of severity, whether severity scores increase progressively among individuals who continue to drink heavily, and whether scores diminish significantly following advice, counselling, and other types of intervention. A screening test should not be conceived in isolation from intervention and treatment. It must be evaluated in terms of its impact on the morbidity and mortality of the population at risk. Its contribution to secondary prevention is therefore dependent on the availability of effective treatment strategies.

4. What is the validity of AUDIT in different risk groups using different validation criteria? In future evaluations of the AUDIT screening procedures, careful attention should be given to defining the alcohol-related phenomena to be detected or predicted. With increasing emphasis now being given to the differential assessment of various aspects of alcohol dependence, as well as alcohol-related disabilities, and the empirical identification of alcoholic subtypes, it would seem that the validity of screening tests could be improved by focusing on more carefully defined risk groups and more specific alcohol-related problems. Specification of high-risk target populations whose problems are to be the focus of screening with AUDIT will enhance the development of reliable and valid screening programmes, provide clearer criteria for their evaluation, and improve the cost/benefit ratio of a screening programme.

5. What is the practical utility of AUDIT? Important constraints on screening tests are imposed by cost considerations and by the acceptability of screening to both health professionals and the intended target populations. When screening tests are expensive, the results of a screening programme may not justify its cost. This is also true when the procedure is time consuming, overly invasive, or otherwise offensive to the target group. This type of process evaluation should be conducted with AUDIT.

6. What is the relationship between AUDIT scores, considered as both categorical and continuous measures, and other screening tests, such as the CAGE, MAST, LeGô procedure, and biochemical markers? This should

provide a useful evaluation of the construct validity of AUDIT, although careful attention should be given to any overlap or duplication in item content. To the extent that AUDIT contains similar questions or procedures, any concordance between AUDIT and other tests may be a reflection of its reliability rather than its validity.

7. What are the relative merits of AUDIT and the Clinical Screening Procedure when used alone and in combination with each other? Does the Clinical Procedure identify persons who score low on AUDIT, and if so, what are their characteristics?

8. Can AUDIT be scored to produce separate assessments of hazardous use, harmful use and alcohol dependence? If screening can be differentiated into these separate domains, it may prove useful for the purpose of evaluating different educational and treatment approaches to secondary prevention.

9. How can AUDIT be used in epidemiological research? AUDIT may have applications as an epidemiological tool in surveys of health clinics, health service systems and general population samples. Because it was developed as an international instrument, it may be a useful way to compare samples drawn from different national and cultural groups, with respect to the nature and prevalence of hazardous drinking, harmful drinking and alcohol dependence.

10. What is the concurrent validity of AUDIT items and total scores when compared with different "objective" indicators of alcohol-related problems, such as blood alcohol level, biochemical markers of heavy drinking, public records of alcohol-related problems, and observational data obtained from persons knowledgeable about the patient's drinking behaviour. To the extent that verbal report procedures may have intrinsic limitations, it would be useful to evaluate under what circumstances AUDIT results are biased or otherwise invalid. Procedures to increase the accuracy of AUDIT should also be investigated (see reference 14 for suggestions).

11. How acceptable is AUDIT to primary care workers? How can screening procedures best be taught in the context of educating health professionals? How extensively are screening procedures using AUDIT applied once students or health workers are trained?

Further information about research applications and validation research can be obtained by writing to the Programme on Substance Abuse, World Health Organization, 1211 Geneva 27, Switzerland.

## **APPENDIX B: Validity of AUDIT and Clinical Screening Instrument**

Based on the sample of 913 drinking patients, Saunders et al. (see references 9,10,15 and 16) evaluated the accuracy of AUDIT in detecting harmful and hazardous alcohol consumption by comparing the sensitivity and specificity for five different “gold standards”: 1. hazardous alcohol consumption (defined as a typical daily intake exceeding 60g for a man and 40g for a woman) or recurrent intoxication; 2. dependence symptoms (a positive response to at least one feature of the alcohol dependence syndrome); 3. alcohol problems in the last year/a positive response to any of five questions on physical and psychosocial consequences); 4. a combined index (which was a summation of all the evidence of harmful or hazardous alcohol consumption from the data set); and 5. positive classification within groups of known alcoholics or abstainers. The cut-off points for the screening instrument were determined by examining the relationship between sensitivity and specificity for the first four conditions. Two cut-off points were determined, 8+ and 10+. Using the lower cut-off point the sensitivity for hazardous consumption and/or recurrent intoxication ranged from 95% to 100%. For dependence symptoms it varied from 93 to 100%, and for the problems in the last year from 91% to 100%. The sensitivity using the combined index ranged from 87 to 96%, with the overall value being 92%. The specificity of AUDIT with respect to the combined index ranged from 81 to 98%, with an overall value of 93%. When the cut-off point of 10 was taken, the sensitivities were lower, with an overall value of 80% for the combined index. The specificities were correspondingly higher: for the combined index values ranged from 95 to 100%, with an overall value of 98%.

Among the drinking patients, all those who had three or more dependence criteria had a score of 10 or more. Of the known alcoholics, 99% had a score of 10 or more. Less than 2% of the non-drinkers had a score of 8 or more.

Using a score of 5 or more as indicating a “positive” case, the sensitivity and specificity of the clinical procedure were also examined, again using “hazardous alcohol consumption” as the reference standard. The sensitivity varied from a low of 13% in Bulgaria of 67% in Norway with a mean value of 41%. The specificity was better, ranging from 81% to 97% with a mean of 92%. It performed poorly in comparison with the core instrument in all centres except Norway, where it was superior. The marketed centre-to-centre variation in validity suggests that disguised screening procedures may be feasible but that country-specific tests may need to be devised. Sensitivity was also calculated using the alcoholics as the criterion group. The results averaging 74% across centres indicate that the clinical procedure may have limited utility even for the detection of alcoholics.

Additional research on the reliability and validity of AUDIT has been reported by Fleming et al. (see reference 17).