

New Strategies to Detect Alcohol Use Disorders in the Preoperative Assessment Clinic of a German University Hospital

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Background: Although alcohol use disorders (AUDs) have enormous public health consequences, the rate of diagnosis of AUDs remains unsatisfactorily low. The primary aim of this study was to compare the detection of AUDs by anesthesiologists in a large preoperative assessment clinic to that by computerized self-assessment of the Alcohol Use Disorder Identification Test. Secondary outcome measures were to compare the actions taken by anesthesiologists upon a finding of an AUD.

Methods: One thousand five hundred fifty-six patients were included. Before preoperative assessment, patients were asked to complete the Alcohol Use Disorder Identification Test (positive scores: men ≥ 8 , women ≥ 5) using a computer. The authors performed a retrospective chart analysis of the anesthesiologists' actions upon a finding of an AUD. The anesthesiologists were blinded to the results of the computer-based assessment and to the subsequent chart analysis.

Results: The prevalence rate of AUDs determined by the anesthesiologists was 6.9% (107 of 1,556), whereas the proportion of patients positive for an AUD using the computerised Alcohol Use Disorder Identification Test was 18.1% (282 of 1,556) ($P < 0.001$). The detection rate by the anesthesiologists of AUDs among men was significantly higher than among women ($P < 0.001$) as well as in the elderly compared with younger patients ($P < 0.001$). Action taken by anesthesiologists was mainly based on evaluating quantity of alcohol consumption.

Conclusion: The computer-based self-assessment increases detection rates of AUDs in busy settings such as a preoperative assessment clinic. Prevalence rates of AUDs are underestimated. Best-practice guidelines for detection of AUDs are not implemented in the daily clinical routine. Barrier analysis is urgently required.

IN 2006, the World Health Organization reported that Europe had the highest rates of alcohol consumption worldwide and that alcohol was the third highest risk factor for death and disability in the general population and the leading risk factor for young Europeans.¹ Alcohol use disorders (AUDs) include a broad spectrum of alcohol problems, ranging from hazardous use, abuse, or harmful consumption to dependence. Recurrent traumatic injury is strongly associated with AUDs,² as are a multitude of disabling physical and mental illnesses.³ In addition, maternal alcohol consumption during pregnancy might lead to fetal alcohol spectrum disorders, with a prevalence of approximately 1% of live births.^{4,5}

It has been established that patients consuming more than 60 g of alcohol per day, which corresponds to six standard drinks each containing 10 g of pure ethanol (e.g., 250 ml of beer containing 5% alcohol/volume), are at increased risk of postoperative complications, including alcohol withdrawal syndrome, infection, sepsis, bleeding, acute cardiac events, and even death.⁶⁻¹⁰ Accordingly, several potential measures aimed at minimizing the excess perioperative risk associated with high alcohol consumption have been investigated.¹¹⁻¹⁴

Possible measures might include a 4-week period of abstinence before elective major surgery,^{10,15} inhibition of the hypothalamic-pituitary-adrenal axis in case of earlier surgery,¹³ and medication-based prevention of alcohol withdrawal. Preoperative screening for AUDs provides the opportunity not only to select patients for preventive perioperative interventions, but also to screen large and diverse patient populations for at-risk drinkers whose drinking behavior may become dangerous at some point in the future. The development of harmful alcohol consumption and its attendant health and psychosocial consequences might be prevented through betimes brief intervention strategies.¹⁶⁻¹⁸

Therefore, anesthesiologists can play an important role in preventing severe consequences of AUDs and thereby contributing to an improvement of public health.

Although there is consensus that AUDs are a common problem with enormous public health consequences and a large body of research exists describing simple but effective screening instruments for the detection of AUDs, the rate of diagnosis of AUDs remains unsatisfactorily low.¹⁹⁻²¹ Grob and Wensing²² reported that more than 30% of patients do not receive a standard of care that would be considered consistent with current evidence-based best

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practice guidelines. To bridge the gap between evidence-based practice guidelines and clinical reality, protocols and algorithms have been developed that have been demonstrated to lead to an improved quality of care.²³ Accurate and reproducible detection of AUDs relies on a combination of clinical and alcohol-specific history taking, physical examination, laboratory investigation, and questionnaires.²⁴ The 10-item Alcohol Use Disorder Identification Test (AUDIT) is recommended by the World Health Organization for the detection of hazardous and harmful alcohol consumption and has been found to be a sensitive indicator for AUDs.^{25–28} The AUDIT is included in the evidence-based Charité algorithm for detecting harmful alcohol consumption,²⁴ which is itself an integral part of the standard operating procedures of the preoperative assessment clinic at our department.

Patient openness to questioning regarding their alcohol use has been shown to be high when this is done in the context of a short motivational intervention.^{29,30} In busier settings, such as the emergency department, computer-based questionnaires are reported to be a useful screening tool.¹⁸

The primary aim of this study was to compare the detection of AUDs by anesthesiologists in a large preoperative assessment clinic with that by computerized self-assessment of the AUDIT. Secondary outcome measures were to compare the action taken by anesthesiologists upon a finding of an AUD with the actions recommended in widely available best-practice guidelines.

Materials and Methods

Setting

The study was conducted in the preoperative assessment clinic of the Charité University Hospital, Campus

Charité Mitte and Campus Virchow-Klinikum, Berlin, Germany, between February and June 2006. The Charité University Hospital is one of the largest hospitals in Europe. Approximately 50,000 anesthetics are performed each year. Each patient is seen by an anesthesiologist in the preoperative assessment clinic. There are two principal goals of this visit. The first is to clarify the anesthesia-related risks of the proposed surgery, and the second is to establish the patient's personal level of risk.

In total, 232 anesthesiologists are employed in our department. Eight anesthesiologists (residents), including 2 senior supervisors (specialists), work permanently in the preoperative assessment clinic during day shifts from Monday to Friday from 9 AM to 5 PM. As the need arises, another 5–10 residents join the preoperative assessment clinic. Some of them perform ward visits should the patient not be able to attend the preoperative assessment clinic himself or herself (e.g., due to admission to the intensive care unit, being bedridden, or a requirement of emergency care). The study was conducted at the preoperative assessment clinic during regular day shifts on weekdays only.

Patients and Study Design

This study was designed as a prospective observational study. After the approval of the institutional review board (Provincial Ministry for Health and Social Affairs in Berlin, Berlin, Germany) and after giving written informed consent, 1,921 consecutive patients were enrolled in the study (fig. 1).

A total of 10,302 patients were referred to the preoperative assessment clinic during the study period. Three thousand five hundred eleven were referred to

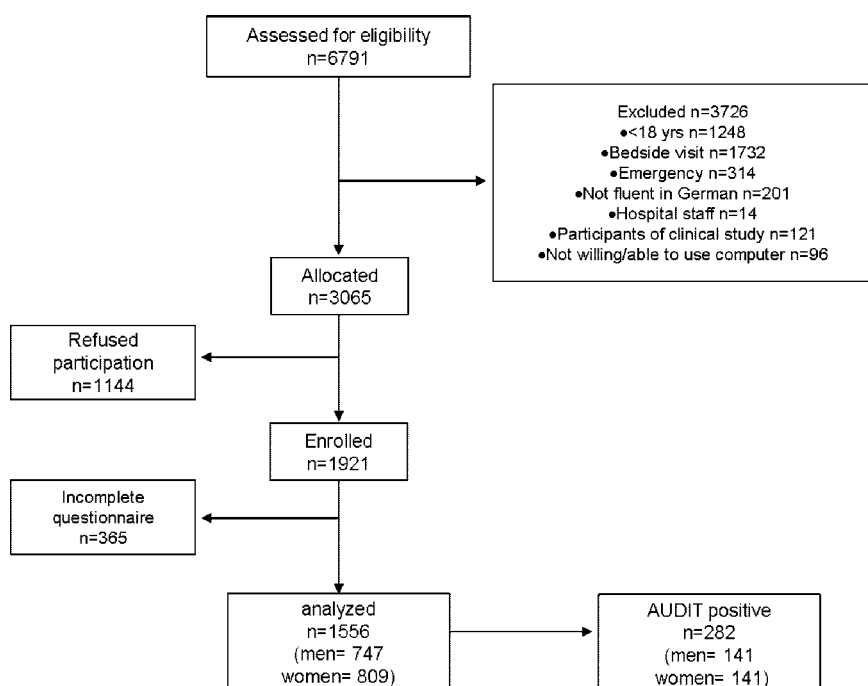


Fig. 1. Flowchart of phases of the clinical trial. AUDIT = Alcohol Use Disorder Identification Test (positive: men \geq 8, women \geq 5).

the clinic outside normal working hours and therefore were not enrolled. The remaining 6,791 patients were assessed for eligibility (fig. 1). All surgical patients aged 18 yr or older were considered to be potential candidates. Patients were not included if they were unable to give informed consent, were unable to attend the preoperative assessment clinic, were emergencies, were admitted in police custody, had insufficient knowledge of the German language, were unwilling to use or incapable of using a computer, were members of the hospital staff, were relatives of the study team, or were already participants in another clinical trial. Of the potential candidates, 3,726 fulfilled one or more exclusion criteria. One thousand one hundred forty-four patients declined to participate. The remaining 1,921 patients were enrolled in the study. The analysis revealed that 365 of these patients did not complete the questionnaire, and these patients were excluded retrospectively from the data analysis.

Measurements

Patients were approached with intent to enroll before seeing the anesthesiologist. Upon receipt of written informed consent, patients' demographic parameters and basic characteristics as well as sex, age, weight, height, and smoking habits were documented. Patients were then asked to complete a lifestyle assessment questionnaire on a portable computer. The 10-item AUDIT was embedded within the computerized questionnaire (appendix).³¹ For simplification purposes, a mouse-only technique was used; keyboard typing was not required. Questions were displayed consecutively on a gray screen. To prevent the accidental skipping of questions, each question was displayed at least 1 s after completion of an item. If the patient chose the option "never" on the first question of the AUDIT ("How often do you have a drink containing alcohol?"), the electronic interview ended.

AUDIT Scores Given by the Patients' Computer-based Self-assessment

The AUDIT score ranges from 0 to a maximum of 40 points.³¹ Presence of an AUD was defined as an AUDIT score of 8 or more points for men or an AUDIT score of 5 or more points for women³² (appendix).

Detection Rate

After completing the questionnaire, patients went to see the anesthesiologist on duty for preoperative assessment. The anesthesiologist did not have access to the

results of the computer assessment. Possible differences between the anesthesiologist's assessment and the patient's computer-based assessment were not analyzed until the end of the study.

The anesthesiologists were considered to have detected an AUD if they had ticked a field marked "alcohol" on the preoperative assessment sheet or if they made a specific referral to any form of AUD or wrote anything to suggest that they considered that the patient might have an AUD in a free text section of the preoperative assessment sheet. Henceforth, we will refer to a positive finding of an AUD by an anesthesiologist as "detection."

In addition, the preoperative assessment sheets filled out by the anesthesiologists were reviewed for the ordering of preventive measures.

In any case, if a patient was considered to be at risk of developing serious complications, an independent data safety monitor not involved in the study and not involved in the clinical routine informed the anesthesiologist having responsibility in further treatment of the patient (after completion of the preoperative assessment), so that they could consider preventive measures.

Preoperative Assessment Protocol

Anesthesia-related risks of the proposed surgery as well as the patient's personal level of risk are documented on the preoperative assessment protocol. This protocol has an icon to mark AUD alongside various other icons, such as for coronary artery disease or diabetes mellitus. The protocol serves as the communication medium between the attending anesthesiologists.

Charité Algorithm

The evidence-based algorithm (fig. 2)^{# 31,33-35} for detecting harmful alcohol consumption forms part of our quality management and is an established part of the standard operating procedures of the preoperative assessment clinic. The standard operating procedures including the algorithm are available in digital and printed form in every examination room of the preoperative assessment clinic.

Implementation Rate

Implementation rate was defined as the frequency with which the documentation of preoperative assessments by the anesthesiologists was in agreement with the evidence-based algorithm.

Statistical Analyses

Statistical analyses were performed using SPSS (version 14.0; SPSS Inc., Chicago, IL). Basic patient characteristics are reported as frequencies and proportions (percentages) or as median and range of the 25th-75th percentiles. Categorical and nonnormally distributed metric data were compared by means of the nonparametric Mann-Whitney U test.

Harmful use and alcohol dependence: Screening, diagnosis, brief intervention. Guidelines of the German Society for Addiction Research and Treatment and the German Society for Psychiatry, Psychotherapy and Mental Disease. Available at: <http://www.uni-duesseldorf.de/awmf/ll/076-003.htm>. Accessed January 10, 2008.

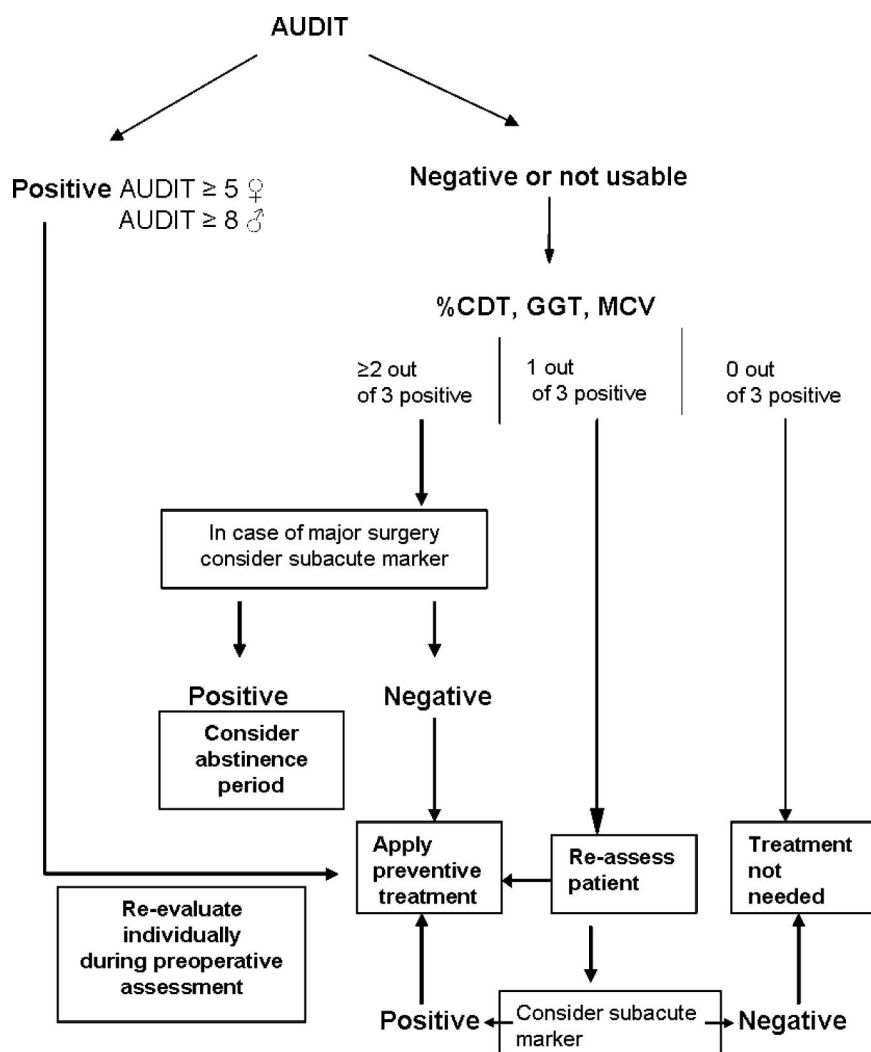


Fig. 2. The evidence-based algorithm for detecting harmful alcohol consumption. AUDIT = Alcohol Use Disorder Identification Test (range, 0–40); %CDT = carbohydrate-deficient transferrin (reference range, < 2.6%); GGT = γ -glutamyl transpeptidase (reference range, ≤ 55 U/l); MCV = mean corpuscular volume (reference range, 81–100 fl); subacute marker = ethyl glucuronide in urine samples.

Frequencies and proportions are presented with their confidence intervals (CIs). Differences in proportions were compared using the chi-square test. If the expected frequencies were smaller than 5, a Fisher exact test was used. Cross-tables with frequencies in the sense of ordered categories were tested by means of the linear-by-linear association test.

$P < 0.05$ was considered statistically significant.

Results

One thousand nine hundred twenty-one patients were enrolled in this study. Three hundred sixty-five patients did not start or complete the questionnaire. They were excluded from further analyses. Basic characteristics of these patients are shown in table 1. In total, 1,556 patients were analyzed, including 809 women (52%) and 747 men (48%) (table 2).

The computer-based prevalence rate for AUDs was in total 18.1% (CI, 16.3–20.1; 282 of 1,556), equally distributed between male and female patients (table 2). Pa-

tients with an AUD were significantly younger and were more frequently smokers than patients without an AUD. Furthermore, patients with an AUD reported a history of traumatic injury more frequently than patients without an AUD (table 2).

Results of the computer-based self-assessment of the AUDIT and physicians' detection rates of AUDs during

Table 1. Basic Characteristics of Patients Who Did Not Start or Complete the Computer-based Self-Assessment

	Uncompleted Questionnaire
n (%)	365 (19)
Women, n (%)	171 (46.8)
Men, n (%)	194 (53.2)
Age, median (25th–75th quartiles), yr	46 (35–60)
BMI, median (25th–75th quartiles), kg/m ²	25.0 (22.5–28.3)
Current smoking, n (%)	109 (29.9)
ASA physical status, median (25th–75th quartiles)	2 (1–2)

ASA = American Society of Anesthesiologists; BMI = body mass index.

Table 2. Basic Patient Characteristics According to the Computer-based Self-assessment

	AUDIT Positive	AUDIT Negative	P Value
n (%)	282 (18.1; CI, 16.3–20.1)	1,274 (81.9; CI, 79.9–83.7)	
Women, n (%)	141 (17.4; CI, 14.9–20.2)	668 (82.6; CI, 79.8–85.1)	0.459
Men, n (%)	141 (18.9; CI, 16.2–21.8)	606 (81.12; CI, 78.2–83.8)	0.459
Age, median (25th–75th quartiles), yr	42 (27–53)	49 (36–63)	<0.001
BMI, median (25th–75th quartiles), kg/m ²	24.7 (21.9–27.7)	25.0 (22.3–28.6)	0.123
Current smoking, n (%)	147 (52.1)	343 (26.9)	<0.001
ASA physical status, median (25th–75th quartiles)	2 (1–2)	2 (1–2)	0.004
Comorbidities, n (%)			
Cardiac	21 (7.6)	123 (10.0)	0.215
Liver	6 (2.2)	39 (3.2)	0.374
Hypertension	56 (20.3)	310 (25.2)	0.084
Diabetes	13 (4.7)	92 (7.5)	0.099
Lipometabolic disorder	13 (4.7)	76 (6.2)	0.344
Depression	25 (9.0)	78 (6.4)	0.113
Trauma	54 (19.4)	161 (13.0)	0.006

ASA = American Society of Anesthesiologists; AUDIT = Alcohol Use Disorder Identification Test (positive scores: men ≥ 8 , women ≥ 5); BMI = body mass index; CI = confidence interval.

preoperative assessment are shown in figure 3. Allocation to the different disciplines is shown in figure 4.

The overall detection rate based on the anesthesiologists' preoperative assessments was 6.9% (CI, 5.7–8.2; 107 of 1,556), compared with a rate of 18.1% (CI, 16.3–20.1; 282 of 1,556) using the computerised questionnaires. Anesthesiologists rated 10.8% of men (CI, 8.8–13.2; 81 of 747) and

3.2% of women (CI, 2.2–4.6; 26 of 809) ($P < 0.001$) as positive, compared with 18.9% of men (CI, 16.2–21.8; 141 of 747) and 17.4% of women (CI, 14.9–20.2; 41 of 809) who were positive using the computer version. Elderly patients (aged ≥ 50 yr) were significantly more frequently detected by the anesthesiologists than were younger patients (aged < 50 yr) ($P < 0.001$).

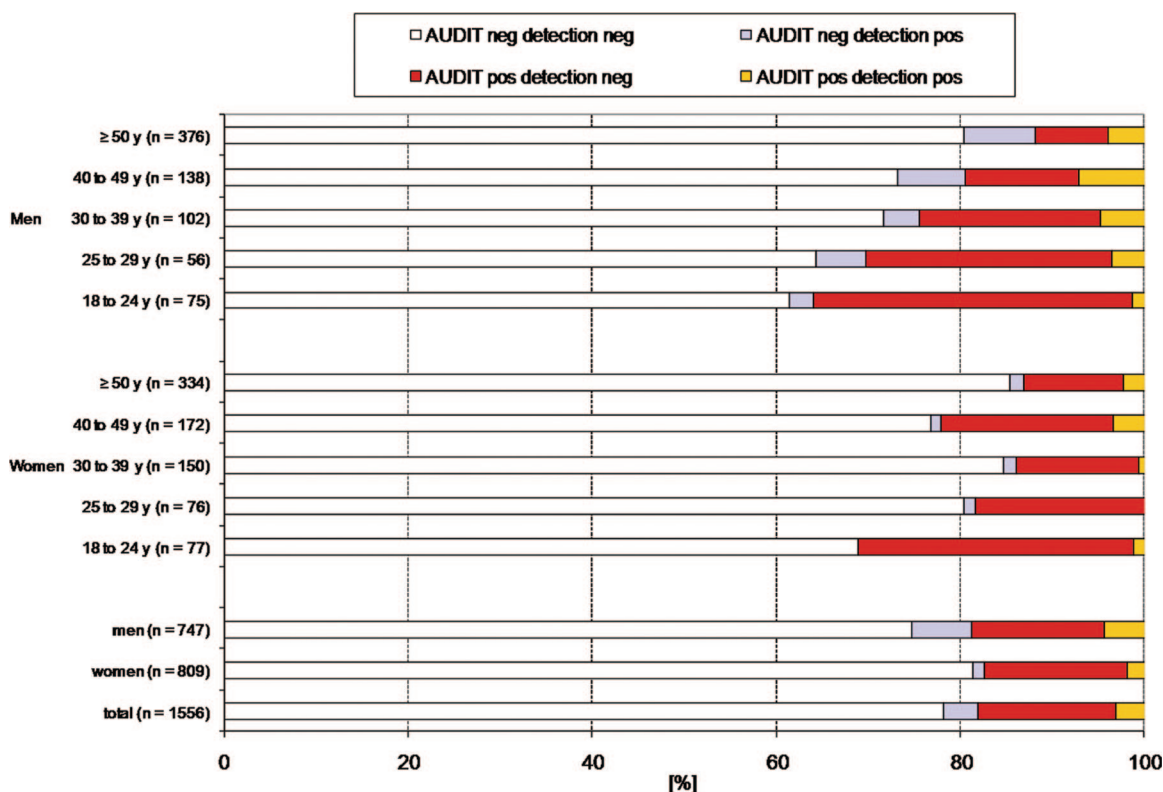


Fig. 3. Computer-based self assessment of the Alcohol Use Disorder Identification Test (AUDIT; positive: men ≥ 8 , women ≥ 5) and anesthesiologists' detection rate of alcohol use disorders during preoperative assessment: sex and age differences (n = 1,556). $P < 0.001$: Women are less frequently detected than men among all patients (total). $P < 0.001$: Elderly (aged ≥ 50 yr) patients are more frequently detected than younger patients (aged < 50 yr) among all patients (total). $P = 0.008$: Women are less frequently detected than men among AUDIT-positive patients. $P < 0.001$: Elderly (aged ≥ 50 yr) patients are more frequently detected than younger patients (aged < 50 yr) among AUDIT-positive patients. neg = negative; pos = positive.

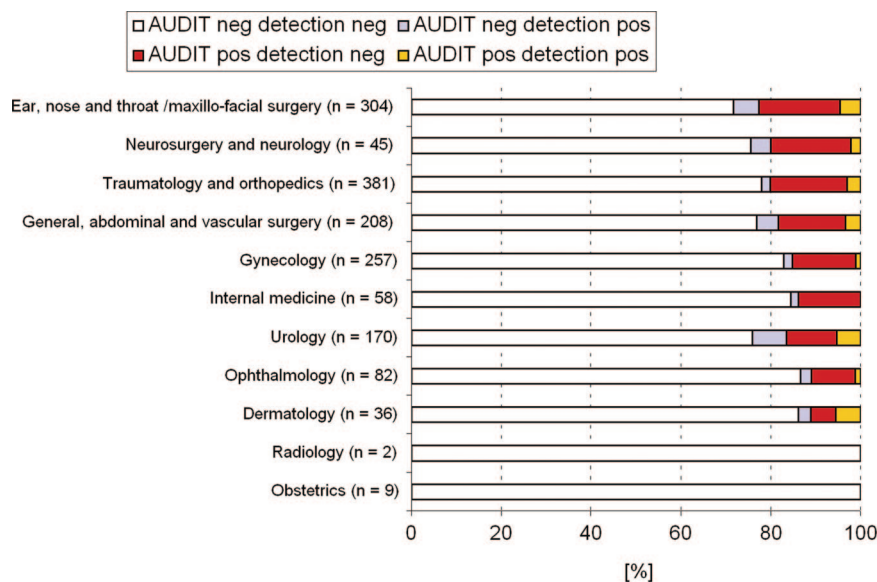


Fig. 4. Computer-based self assessment of the Alcohol Use Disorder Identification Test (AUDIT; positive: men ≥ 8 , women ≥ 5) and anesthesiologists' detection rate of alcohol use disorders during preoperative assessment in the different disciplines (n = 1,556). neg = negative; pos = positive.

The detection rate by anesthesiologists among AUDIT-positive patients was only 17.4% (CI, 13.3–22.1; 49 of 282). The detection rate of female AUDIT-positive patients (11.4%; CI, 6.9–17.4) was significantly less than that of male AUDIT-positive patients (23.4%; CI, 17.0–30.1) ($P = 0.008$). The elderly AUDIT-positive patients (aged ≥ 50 yr) were more likely to be detected than younger patients (aged < 50 yr) ($P < 0.001$).

The subgroup of AUDIT-positive patients with the highest detection rate by anesthesiologists (36.7%) was those with daily or near daily alcohol consumption (90 of 282). Anesthesiologists detected 17.2% of AUDIT-positive patients with hazardous drinking behavior; 20% of those reporting alcohol-related harm and 25.2% of patients with symptoms of dependence according to the AUDIT criteria were detected.

In 59.2% of the detected AUDIT-positive patients (29 of 49) and in 10.3% of all AUDIT-positive patients (29 of 282), respectively, the detection was based on the quantity of alcohol consumption and/or type of beverage. Of these detections, the quantity of alcohol consumption per day, week, or month was recorded in 69% of cases (20 of 29). Of these cases, where the level of consumption was recorded, 50% of the patients (10 of 20) reported an intake of 60 g/day or more.

The detection rate by anesthesiologists of AUDIT-negative patients was 4.6% (CI, 3.5–5.8; 58 of 1,274). Of these patients, 79.3% (46 of 58) were men and 77.6% (45 of 58) were aged 40 yr or older. Of these patients, 17.2% (10 of 58) were abstinent problem drinkers. In 53.4% of these “false-positive” cases (31 of 58), the detection was based on the quantity of alcohol consumption and/or type of beverage. In 74.2% of these cases (23 of 31), the quantity per day, week, or month was recorded. In 2 of these 23 patients, the average alcohol consumption was 60 g/day or greater. In 6 cases, the type of beverage was recorded only. In another 5 cases, the anesthesiologist

considered that the patient might have an AUD, as stated in a free text section. In 24.1% of detected but AUDIT-negative patients (14 of 58), the anesthesiologists marked the field “alcohol” on the protocols without any further explanation.

An acceptable level of adherence to the algorithm for the detection of AUDs was not found on any of the anesthesiologists' preoperative assessment forms (on none of the evaluated assessment sheets [n = 1,556] was the performance of recommended guidelines for detecting harmful alcohol consumption documented).

Preventive or intervention measures were not advised in any of the patients detected by the preoperative assessment clinic anesthesiologists. The independent data safety monitor informed the further attending anesthesiologist in all AUDIT-positive patients who scored positive on at least one of the AUDIT items related to dependence (n = 153).

Discussion

Although 1 in 6 patients had an AUD according to their computerised AUDIT scores, anesthesiologists detected only 1 in 14 patients during the routine preoperative assessment. Furthermore, only 17.4% of the AUDIT-positive patients were detected during the physicians' preoperative assessments. Preventive measures were not advised in any of the patients detected. Reported detection rates of AUDs range from 7% up to 65%.^{19–21} In our study, physicians were blinded to the results of the AUDIT questionnaires but had an evidence-based algorithm for the detection of AUDs at their disposal in addition to the conventional means of detecting AUDs.

A computer-based version of AUDIT has not been studied previously in a systematic manner to screen for AUDs in the setting of a preoperative assessment clinic.

Computer-based self-assessed prevalence for AUDs compared with the prevalence determined by anesthesiologists during the physician-patient conversation has not been assessed hitherto, either. The approach of the physicians at this department to screening for alcohol misuse was heavily based on the quantity of alcohol consumption. Specifically quantifying daily alcohol consumption was not in fact an element of the evidence-based algorithm available to the physicians. There is evidence to show that relying only on questions regarding typical quantities of alcohol consumed or on questions regarding standard units or type of alcohol can lead to an underestimation of the problem.³⁶ When evidence-based algorithms are implemented, detection rates increase.³⁷

In our study, none of the physicians used the evidence-based algorithm. Barriers of implementation might be found in, *e.g.*, the educational level of the physicians referring AUDs³⁸ or an underreporting or neglecting of alcohol consumption of the patient³⁹—maybe when interrogation is not anonymous—as well as physicians' discomfort and avoidance referring alcohol related questioning.⁴⁰

There is no gold standard for the detection of AUDs, and accordingly, reported detection rates will vary with the selected definition/true measure of AUDs.⁴¹ Selection sample bias is also a recognized significant contributor to reported detection rates of AUDs.⁴² In our study, we selected the patients' self-assessed AUDIT scores (a positive test result being a score of ≥ 8 for men and ≥ 5 for women) as the measure of the true rate of AUDs. The AUDIT score is intended to detect patients with hazardous alcohol use, alcohol-related harm, or symptoms of dependency.

In almost 5% of the AUDIT-negative patients, the physicians detected the presence of an AUD. On closer examination, it emerged that 17.2% of these patients were abstinent problem drinkers. Most items in the AUDIT score refer to the past 12 months, and abstinent drinkers of greater than 12 months' duration are intentionally assigned low scores. In 58.6% of these "false-positive" detections, the diagnosis was based primarily on quantity of alcohol consumption. In fact, only two of these patients reported consuming 60 g or more alcohol per day. This observation serves to underline the fact that quantity of alcohol consumption alone is not a reliable indicator of alcohol misuse.

In our study, the prevalence rate of AUDs using AUDIT was similar in women (17.4%) and men (18.9%) and comparable to other recently published data.⁴² However, women were significantly less frequently detected than men. In addition, young patients were significantly less frequently detected than patients of advanced age. These observations may reflect the fact that physicians tend to underestimate and miss AUDs in younger patients and especially in younger female patients. Our results also emphasize the fact that the use of (computer-based) algorithms applied to every patient for the iden-

tification of AUDs is an effective means of tackling these biases.

As we mentioned in the introduction, preoperative screening for AUDs not only offers the possibility to prevent severe disabling perioperative complications, but is also a unique opportunity for intervention. Our study suggests that this may be especially important in the case of younger patients presenting at the preoperative assessment clinic. Alongside our role as anesthesiologists, we, as physicians charged with these patients' care, are also presented with both the challenge and the opportunity of intervening in problem and at-risk drinking before the long-term physical and psychosocial complications have developed.

According to the German Health Ministry, more than 10 million Germans have harmful levels of alcohol consumption.⁴³ A further 1.6 million are regarded as alcohol dependent. Only 10% are ever referred to or seek therapy—often only after years of dependency.⁴³ The preoperative assessment allows for screening and documentation of the presence of an AUD and subsequent communication about it to the attending anesthetist (and later on to the postanesthesia care unit, intensive care unit, and wards) to reach the goal of a betimes (medication-based) prevention of postoperative complications (*e.g.*, alcohol withdrawal). Quite apart from this, there is evidence to suggest that detection of AUDs and subsequent implementation of brief intervention strategies may decrease alcohol consumption in at-risk drinkers and prevent development into harmful alcohol consumption with its attendant health and psychosocial consequences.^{16–18} In the setting of a preoperative assessment clinic, brief intervention strategies might consist of a brief motivational interview or tailored brief advice (whose basis is provided by the AUDIT items), including the elements Feedback, Responsibility, Advice, Menu of behavioral change, Empathy, and Self-efficiency (FRAMES).⁴⁴ Should a patient desire long-term assistance to change his or her drinking behavior, the preoperative assessment allows for consulting a medical professional educated in the field of AUDs, *e.g.*, a psychologist who contacts the patient postoperatively, offering counseling to stop harmful alcohol consumption.^{15,45} Reducing harmful alcohol consumption is a challenge faced by both politicians and society.⁴³

The first step has already been taken through a frank evaluation of the state of affairs, and the next steps in the process of change are feedback, education, outreach programs, reminders, and detailed barrier analyses.⁴⁶

Limitations of the Study

The AUDIT score has not been subjected to an external validation, *i.e.*, *International Classification of Diseases*, 10th Revision. Nevertheless, current (German) evidence-based guidelines for AUD screening do not themselves include the *International Classification of*

Diseases, 10th Revision, classifications pertinent to alcohol use.[#] In addition, in busy settings such as the emergency department or preoperative assessment clinic, quick methods for the detection of at-risk behavior are realistically more likely to achieve high levels of implementation. Indeed, such methods may be useful for the selection of patients for more detailed evaluation for psychiatric illness and/or intervention.

The study can neither provide data of patients who refused to participate nor provide further data of the enrolled patients with incomplete questionnaires. This has to be taken into consideration when prevalence rates of AUDs are evaluated, because it might be possible that among the nonparticipating population and among those who started but did not complete the computer-based questionnaire, the prevalence rate of AUDs is unusually high or low. However, the study protocol of this study did not allow for obtaining data from patients who did not give written informed consent. Possible reasons for patients not being willing to participate in the survey could include embarrassment of breaking social rules, as well as the fact that patients often undergo a series of examinations (with sometimes long waiting times) on the same day of the preoperative assessment. Although physicians' characteristics, such as their demographics or level of education, might have influenced the detection rate, the study cannot provide any conclusions on these influences. However, the primary aim of this study was to compare the detection of AUDs by anesthesiologists with that by computerized self-assessment of the AUDIT.

Finally, we would like to remark that the order of the two assessments (the computerized version of the AUDIT occurring before the preoperative assessment by the anesthesiologist) might have influenced the patient's disposition to proactively report in the conversation with the physician. However, it is the physician's task to ensure that such information is obtained regardless.

Conclusion

In conclusion, during preoperative assessment, we observed a positive finding of an AUD in 1 in every 14 patients. This increased to 1 in every 6 patients when the AUDIT score was used in the same group of patients. We found that a major contributor to this discrepancy was the fact that physicians tend to underestimate the prevalence of AUDs in women and younger patients. We noted that although a finding of an AUD is made preoperatively, evidence-based perioperative preventative measures are not undertaken. We established the efficacy of a computer-based version of the AUDIT tool for screening for AUDs and suggest that it may also prove to be useful in a variety of other medical settings with high patient throughput. The enormous amount of well-con-

ducted research into AUDs and their social, physical, and psychological consequences will not yield the benefit it should, if we do not implement strategies for the detection of AUDs into daily clinical routine. Our observations in a preoperative assessment clinic illustrate for us the fact that strategy implementation and barrier analysis are urgently required if high levels of compliance with evidence-based algorithms are to be achieved.

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Appendix: AUDIT

Each question has a score ranging from 0 to 4.

1. How often do you have a drink containing alcohol? (0) Never, (1) Monthly or less, (2) 2 to 4 times a month, (3) 2 to 3 times a week (4) Daily or almost daily
2. How many drinks containing alcohol do you have on a typical day when you are drinking? (0) 1 or 2, (1) 3 or 4, (2) 5 or 6, (3) 7, 8, or 9, (4) 10 or more
3. How often do you have 6 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 a doctor or another 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

Total _____

The AUDIT includes assessments of frequency and intensity of drinking (first 3 questions), dependence symptoms (questions 4–7), and harmful alcohol use (questions 8–10).²⁵

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