Session 2.
Identifying ED Patients with Alcohol Problems

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Many patients in the emergency department (ED) have alcohol problems, and they can be identified.[1] Research on techniques used to identify these patients has been conducted, but several areas of interest should be addressed by further research. We need to further examine and refine alcohol-screening questionnaires in the ED. We need to determine the sequence and combination of questions and tests that constitute the best screening process. We need to study barriers to screening, identify factors that promote screening implementation, and demonstrate the impact of a screening program in the ED. The final aim of screening must be improved outcomes through referral and counseling. Identification is only the first step in a process of care.

Alcohol problems defined

Alcohol problems designate a spectrum from risk behavior to illness, and from problematic consumption to alcohol use disorder. We must be careful when interpreting the results of studies, and in our own design of screening procedures, that we are clear about the endpoints we are measuring. Clinicians in the ED are interested in screening for several alcohol endpoints. Acute intoxication is of concern to emergency physicians. Intoxication in a driver would certainly be considered an "alcohol problem." The blood or breath alcohol concentration (BAC), coupled with our clinical observations, may help us identify intoxication. Most alcohol screening tests identify patients with alcohol use disorders or problematic consumption of alcohol. The American Psychiatric Association in DSM III-R, IV[2] and the World Health Organization (WHO) in the 9th and 10th International Classification of Diseases (ICD-9, -10) have rigorously defined alcohol abuse and alcohol dependence.[3] These definitions largely agree for dependence, but not for abuse. DSM includes social and legal consequences of abuse and ICD-10 has only medical and psychological consequences. Fewer cases of alcohol abuse meet the ICD-10 definition. In general, an alcohol use disorder is present when an aspect of the patient's function has been compromised

by alcohol. Before function is compromised, problematic consumption occurs. Much of the emphasis of screening has shifted toward identifying patients with high alcohol consumption before disease develops. WHO defines hazardous drinking as 4 or more drinks/day for men and 2 or more drinks/day for women. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines at-risk drinking as consumption of more than 14 drinks/week or more than 4 drinks/occasion for men ages 18 to 65. For women of all ages and men older than age 65, more than 7 drinks/week or more than 3 drinks/occasion is considered at risk. Binge drinking alone is also of concern and has been variably defined as more than 3, 4, 5, or 6 drinks on an occasion.[4]

Characteristics of an ideal ED screening test or sequence of tests

An ideal screening test would be accurate, practical, and motivational. The accuracy of a test can be measured in several ways. For a screening test, high sensitivity is the most desirable parameter. High sensitivity ensures that most of the patients with problems will be detected. High specificity is also desirable to help ensure that positive tests represent real problems. There is a trade off between sensitivity and specificity defined by the receiver operator curve. The area under the operator curve best reflects the performance of a test; the larger the area the better the test. Each point on the curve represents a potential "cut point." A cut point with a high sensitivity and specificity should be manifest in an ideal test.

Theoretically, an ideal test should remain accurate throughout the alcohol use spectrum. However, real tests don't perform uniformly across a spectrum. For example, if we're interested in identifying patients with binge drinking, we can define binge drinking as 3, 4, 5, or 6 drinks on an occasion. Screening tests designed for patients with more severe problems (6 drinks) will be less sensitive at identifying patients with less severe problems (3 drinks).

An ideal test would perform uniformly in all populations and subgroups. However, when we screen populations with high case rates (trauma admissions, 63%),[5] a highly sensitive test with moderate specificity performs well. The same test used to screen a population with low case rates (pregnant clinic patients, 7%)[6] does not perform as well. In this population, a test with higher specificity may be needed to avoid

too many false positives. A test that is used to screen a diverse population (such as ED patients) will perform better in some subgroups than others based of the different case rates among subgroups.

An ideal test should remain accurate in the presence of common ED problems, such as stress, injury, acute illness, intoxication, other drug use, depression, and anxiety disorders. Many of the screening tests were developed outside the ED. Fortunately, many have been applied to ED populations. Hence, their performance has been demonstrated in the presence of some of these distracting factors. An ideal test should also remain accurate with differences in gender, age, race, ethnicity, or language. Some variation in test performance among demographic groups has been demonstrated in studies of screening tests in the ED.[7,8] An ideal test in the ED would address both current and lifetime alcohol problems. Current use would more likely prompt referral or counseling, but past use predicts poor outcome from medical problems such as injury.[9]

In research trials, the impracticality of a screening test may not be evident. Research staff do not have to contend with adding a screening test to an already lengthy list of clinical care duties. In clinical practice, several practical issues will make all the difference to successful implementation. The ease of use of a screening test will determine its success. Staff with any level of prior health training and little additional training should be able to administer an ideal test. Results should be immediately available and easy to interpret. The test should be acceptable to regulators, payers, ED staff, and ED patients.

Several factors may interfere with implementation. For example, patients may find certain questions offensive, or they may not be willing to have blood drawn or submit to breathalyzers. Clinical staff may be uncomfortable asking some types of questions. Regulators may restrict access to records based on answers to certain questions and add burdens to hospital record-keepers. Payers may pay for some tests and not others. These and other factors may reduce the effectiveness of a screening procedure that has been proven effective in research trials.

Most experts agree that an ideal ED test is brief (1 to 2 minutes). Most of the quest to develop efficient ED screening has emphasized brevity. However, a longer test could be self-administered. An ideal screening test should not interfere with the routine sequence of medical history, physical examination, and laboratory testing. The test should be

confidential since there may be legal, financial, or social consequences to screening positive. Finally, the ideal test should actually motivate the patient to further assessment, counseling, or referral as needed.

Currently available screening tests

Based on current evidence, screening should be undertaken using one or a combination of structured questionnaires.[10] Screening undertaken using clinical impression or biochemical tests is not as accurate or as sensitive as structured questionnaires for identifying alcohol use disorders or problematic consumption.[7] Of course, BAC can help identify acute intoxication. The alcohol concentration can be determined by saliva testing, breath analysis, or blood test.[11,12]

Clinical impression

Clinicians often use their general impression to help with diagnosis, but clinical impressions concerning alcohol problems can be inaccurate. Trained practitioners counseling alcoholics could identify only 50% of acutely intoxicated patients.[13] Primary care physicians and emergency physicians identified fewer than 50% of patients with alcohol problems. Unfortunately, the majority of physicians (54%) screen only those patients they suspect based on their clinical impressions.[14–16] Stereotypic profiling may be the consequence of screening only suspected patients. Gentilello reported that in a trauma center ED, staff suspected alcoholism in 26% of patients who screened negative on structured questionnaires. These patients were more likely to be young, male, disheveled, uninsured, and low income.[17] Of course, some ED patients may spontaneously volunteer information about drinking. Cherpitel reported that patient self-report of drinking prior to arrival had a sensitivity of 29% for alcohol problems in the ED.[7]

Structured questionnaires

Self-report may be enhanced when specific alcohol questions are asked. Cyr reported that a single question in a primary care setting—"Have you ever had a drinking problem?"—had a high sensitivity (40% to 70%).[18] Subsequent reports from other institutions did not replicate the high sensitivity of this single question.[19–23] Cherpitel evaluated single question screens in the ED and found them to be less sensitive than structured questionnaires.[7]

Most existing screens were developed for primary care settings to detect alcohol use disorders. The CAGE was developed in 1968 as a brief screening tool for primary care providers to detect alcohol abuse and dependence. CAGE is a mnemonic from four questions, Cut down, Annoyed, Guilty, and Eye opener. The questions address problems over the patient's lifetime. CAGE takes 1 to 2 minutes to administer.[24,25]

The MAST (Michigan Alcohol-Screening Test), developed in 1971 as a screen for alcohol abuse and dependence, has 24 yes/no questions. MAST has been self-administered and used in a computer format. It addresses problems over the patient's lifetime. MAST requires 20 minutes to administer. A shortened version of the MAST exists, a 10-question Brief (B) MAST. BMAST takes 5 to 12 minutes to administer and performs nearly as well as the longer version.[26–28]

SAAST (Self-Administered Alcoholism Screening Test) was developed in 1972 to screen for alcohol abuse and dependence. It has 35 yes/no questions. While lengthy, the SAAST has the advantage of being self-administered, and it has also been administered in a computerized format. It addresses problems over the patient's lifetime. A shortened, 9-item version, the Brief SAAST, takes the patient 5 to 10 minutes to complete.[29,30]

More recently, screens have been developed to detect at-risk drinkers. WHO developed the AUDIT (Alcohol Use Disorder Identification Test) in 1992 as a brief screening tool to detect at-risk drinking in addition to alcohol abuse and dependence. AUDIT has 10 questions. It assesses problems experienced within the last three months and over the patient's lifetime. AUDIT takes 4 to 8 minutes to administer.[31,32]

Several screens have been developed for pregnant women. Concern about even lower levels of alcohol consumption in this group has prompted development of the screens TWEAK, T-ACE, and NET. TWEAK screens for alcohol abuse and dependence. It has five questions, addresses problems over the patient's lifetime, and takes 3 to 5 minutes to administer.[33] T-ACE also screens for alcohol abuse and dependence. T-ACE has three of the four CAGE questions and replaces the guilt question with tolerance question. T-ACE addresses problems over the patient's lifetime and takes 1 to 2 minutes to administer.[34] NET was developed to screen pregnant patients for at-risk drinking, alcohol abuse, and dependence. It is a three-question screen that takes about 1 minute.[33]

One screen has been developed for emergency department use, the Rapid Alcohol Assessment Screen (RAPS4). Cherpitel screened an ED population with questions from CAGE, BMAST, AUDIT, and TWEAK. She created RAPS4 by combining the four highest-yield questions from those screens, which covered feeling guilty after drinking, blackouts, failing to do what is normally expected after drinking, and morning drinking. However, this new instrument has not been studied when administered as a stand-alone test.[35]

In addition to these questionnaires, NIAAA suggests that all primary care physicians ask an opening question—"Do you drink alcohol?"—followed by three questions about alcohol consumption and then the CAGE. This sequence was not explicitly designed or studied as a "screening test." D'Onofrio and others have recommended using the NIAAA approach in the ED.[10]

Studies of screening tests

Cherpitel conducted two studies comparing multiple screening tests in the ED. In the first study, TWEAK and AUDIT were most sensitive, identifying 84% and 81% of patients, respectively, with an ICD-10 diagnosis of alcohol dependence.[7] In the second study, RAPS and AUDIT were more sensitive than TWEAK and CAGE, identifying 79% and 78% compared with 72% and 71%, respectively, of patients with an ICD-10 or DSM-IV diagnosis of alcohol dependence, harmful drinking, or abuse.[5,36]

Soderstrom has compared multiple screening tests in a trauma center. He reported that CAGE performed best, with a sensitivity of 84%, for a DSM-IV diagnosis of alcohol dependence.[37] Fiellin reviewed 38 studies of screening for alcohol use disorder in the primary care setting. For at-risk, hazardous, or harmful drinking, AUDIT was found most effective with sensitivities of 51% to 97%. For alcohol abuse or dependence, CAGE was found most effective with sensitivities of 43% to 94%. As expected, CAGE and AUDIT performed best within the spectrum of alcohol use they were developed to explore.[38]

Screening biases

Cherpitel analyzed variability of test performance in subgroups of ED patients.[39] In her first ED study, CAGE, BMAST, AUDIT, and TWEAK were less sensitive among females, whites, and non-injured patients. In

her second ED study with Hispanic patients, CAGE, BMAST, AUDIT, TWEAK, and RAPS were less sensitive in females, patients with less acculturation, and non-dependent drinkers.[36] Lowering the cut point on these screening instruments improved sensitivity without loss of specificity among females. Using lower cut points for females may maximize screening test performance.[40]

Bradley reviewed nine studies with data on women's responses to screening mainly in primary care settings. CAGE, AUDIT, and TWEAK were the best tests for alcohol dependence among women. Their reported sensitivities were 66% to 92%. All three screens performed better among black women than among white women. TWEAK performed better than CAGE or AUDIT among white women. CAGE and AUDIT had low sensitivities (59% and 48% respectively) for alcohol dependence among white women. We must be careful not to employ screening techniques that do not address important subgroups.[41]

Evidence of such low sensitivity in an important subgroup may necessitate use of multiple screens tailored to subgroups. In addition to women, other subgroups such as adolescents, older adults, pregnant women, psychiatric patients, and Spanish speakers may need screening with modified or unique tests. Standard screens may not perform as well in these patient subgroups that may represent a considerable part of the ED population. Adjustment of cut points or use of alternative screening tests may be necessary for these subgroups.

Alcohol concentration

Many injured ED patients are screened with a BAC, which can help identify intoxication. The presence of alcohol may not always indicate an alcohol problem. While a very high BAC in an unimpaired patient can be a specific screen for dependence,[42] BAC is an insensitive screen for an alcohol use disorder. One study found that only one-third of intoxicated drivers had an alcohol use disorder.[43] In an ED study, BAC was a poor screen for alcohol abuse or dependence with a sensitivity of 20%, less sensitive than self-reported drinking.[7] In another ED study, a saliva alcohol level equivalent to a BAC greater than 0.10 g/dl in an injured patient identified harmful drinkers (AUDIT $\geq$8) with a sensitivity of 65%.[44] In one trauma center, BAC had a sensitivity of 63% for an alcohol disorder.[5] Other biochemical markers such as mean corpuscular volume, platelet count, liver enzymes, gamma-glutamyltransferase (GGT),

aspartate aminotransferase (AST), alanine aminotransferase (ALT), and carbohydrate deficient transferrin (CDT) perform poorly with sensitivities of 13% to 67% for alcohol use disorders or problematic consumption.[45–50] Biochemical tests other than BAC may have use in settings other than an ED, but they offer little as screening tests for ED patients.

Research questions: improving existing screening questionnaires

We still need to find the most accurate test for ED use. This may be RAPS4, which is designed for the ED, but it needs further direct testing. Many tests would be improved by wording questions to address current problems (the past year or three months) rather than lifetime problems. Screening with embedded questions and indirect questions may also improve self-report among adolescents and other groups.[20,51–53] These approaches need further testing in the ED.

The most practical test may be the shortest, the three-question NET. Further sequencing of questions within questionnaires may also improve efficiency.[35] If one question answered "yes" yields a positive test score, asking that one first and stopping as soon as the score is positive would be the most efficient approach. Cherpitel has analyzed the sensitivity of each of the RAPS4 questions and sequenced them from most to least sensitive for most efficient use.[35]

Minimizing question sets for interviews will result in obtaining less information. Computer-administered or self-administered screens may address this issue by allowing patients to spend more time completing in-depth questioning with no additional staff time.[54,55] This approach promises practical avenues for obtaining more information. A trial of screening tests in various formats (e.g., interview, self-administered forms, and computer interaction) should be undertaken to compare their cost and value in the ED.

The most motivational screening test is unknown. Drawing blood and confronting patients with their blood alcohol levels may actually push them away from counseling. Screening questions that reveal the negative consequences or link alcohol to current problems may motivate patients to seek counseling. Providing immediate feedback may help make the transition from screening to counseling with little additional intervention. The motivational aspects of a variety of screens, with and without verbal or computer feedback, need to be explored.

Research questions: finding the best approach to screening

To determine the best of the available screens, a multi-center trial with a broad demographic mix and a large number of patients subjected to different screens is needed. Further evaluation should be performed of lower cut points for TWEAK, CAGE, and AUDIT. The advantage of tailored screens or specific questions for subgroups such as women,[41] adolescents,[54–59] and elders,[60–64] needs to be determined. RAPS4 must be further tested as a stand-alone screen in isolation and against other tests. A longer, self-administered screen—including one administered by computer—should also be tested in the ED.

To determine the best sequence for screening, the approach recommended by NIAAA for primary care should be compared with other sequences. Several trials of variations of the NIAAA approach are warranted. Trials should be conducted starting with other or no opening questions, using other consumption questions such as those in AUDIT, using other screens such as TWEAK rather than CAGE, changing the sequence to CAGE or TWEAK followed by consumption questions, and checking BAC at the beginning or end of the protocol.

The best screen should be determined in the context of a screening and intervention program. Some questions or screens may lead naturally to referral and treatment. Others may not promote referral and treatment. Much of the screening literature is isolated from intervention. Future studies need to incorporate evaluation of screening linked to intervention protocols.

Barriers to implementing screening

In a research protocol in England, nurses were trained to screen all emergency patients with CAGE and then provide feedback. Only 20% of patients were screened. Of them, 19% had positive CAGE scores; of those, only 41% were provided feedback. Even with feedback, only 12% accepted follow-up. Of 4,663 patients, only 13 were entered into the trial and the trial was abandoned.[65,66]

There are multiple barriers to screening. Nurses identified lack of resources, inadequate training, stress, poor morale, and no perceived value to the intervention. In a survey sponsored by the West Virginia Chapter of the American College of Emergency Physicians, a minority of emergency physicians reported routine screening and counseling of ED patients.[67] The authors reported provider attitudes of disinterest,

avoidance, disdain, and pessimism as well as inadequate time, insufficient education, and lack of resources as barriers. Surveys and interventions should be undertaken to define and reduce barriers to implementing screening in clinical practice.

Currently, screening is a research tool, not a clinical tool. ED staff does not use structured questionnaires for alcohol screening. ED staff has no systematic approach to alcohol screening. Staff chooses to screen some individuals and not others based on clinical suspicions or partially implemented protocols. In general, ED staff screens less often than addiction experts recommend.

Universal screening is appropriate in populations with high case rates. EDs have reported high case rates of alcohol problems, especially acute intoxication, from 9% to 31%.[17,28,46,68–71] Within the ED, there are even higher case rates in subgroups. Major trauma, injuries, assaults,[72] depression, and alcohol-related medical problems like gastrointestinal bleeding or seizures define even higher risk subgroups. Many experts advocate focusing screening on some of the highest-risk groups or screening with greater intensity and different tools in these groups.

Implementing screening in clinical practice

Any ED staff member could be assigned the screening task. Physician, nurse, clerical, social work, or volunteer staff can conduct screening. We do not know which staff group will be most effective. Self-administered questionnaires, computer screen interactions, or interview techniques may be easier to implement. Screening questions can be stand-alone or embedded into general health questionnaires or existing registration, physician, and nurse documentation. Screening protocols can be mandatory or voluntary. The approaches that will be most effective in ED practice should be determined by studying the implementation of these strategies in actual ED clinical practices. Studies of the translation of efficacious research practice into clinical practice is needed most since screening instruments have been used by research staff and not clinical staff.

Impact of screening

ED patient care should be improved by implementing alcohol screening programs. A major limit to realizing this improvement is the lack of counseling available to address patients' alcohol problems in most EDs.

Most EDs provide very limited alcohol services. When care is unavailable, screening makes little sense to clinicians. Realizing a gain from screening in an ED is entirely dependent upon linking the screening program to some form of counseling, onsite or through referral services. The impact of screening should be demonstrated in ED environments that have treatment available, an adequate volume of alcohol-involved patients, and the capacity to undertake clinical trials. Studies in these centers should demonstrate the benefits of screening: increased referrals, more patients receiving counseling, and better outcomes such as reduction of risk behaviors.

Summary: research areas of interest concerning screening

The ideal screen that is accurate, practical, and motivational has not been developed. Researchers must continue to analyze the performance of structured questionnaires and try computer-based screening tools in the ED. The sequence of screening tests needs to be evaluated by studying the NIAAA approach and several alternatives. Screening must move from research to clinical practice. Barriers to screening in clinical practice must be identified and removed. Studies of implementation of screening programs in ED clinical practice should be undertaken. The impact of screening on referral and intervention, as well as outcomes such as reduced risk behaviors, must be demonstrated.

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Identifying ED Patients with Alcohol Problems: Research and Prospects—Discussion

Cheryl J. Cherpitel, DrPH

I think Dr. Woolard provided a very thorough overview of the important research questions in identifying patients with alcohol problems in the ED. Certainly, research on screening tests is important in developing the best instrument or the best set of screening items. The application of screening in the ED is also an important area of research in relation to barriers to screening, the process of implementation, and the impact of screening—whether those identified are counseled or are referred for counseling, and if referred, whether the referral is accepted.

As Dr. Woolard pointed out, clinical impression and biochemical tests are not as sensitive as structured questionnaires in identifying patients with alcohol problems. The utility of clinical impression is presently undergoing research by the World Health Organization in a multi-site study that is also examining the prevalence of alcohol-related injury in ED admissions. This study, which includes sites from China, Africa, India, Eastern Europe, Scandinavia, New Zealand, South America, and Mexico, will provide baseline data for subsequent studies of screening and brief intervention in the ED. The study of clinical impression will examine the validity and feasibility of using the ICD-10 Y91 codes in the ED, which determine alcohol intoxication of patients by observational assessment. A triage nurse or physician will clinically evaluate patients as soon as possible after their admission to the ED, and study staff will then administer a breathalyzer test as a validity check. A sample of 500 injured patients arriving at the ED within six hours of injury will be selected from each study site. This will include a probability sample of 300 patients selected on an "around-the-clock" basis, so there will be equal representation of all times of the day for all days of the week. An additional 200 patients will be selected on weekends only, when there will be a greater likelihood that patients will have been drinking. The triage nurse or physician will be trained to observe the following signs of possible intoxication: smell of alcohol on the breath, slurred speech, impairment of motor coordination, impairment of attention and/or judgement, euphoria, disturbances in behavioral responses, disturbances

in emotional responses, impaired ability to cooperate, and horizontal gaze nystagmus. Based on these signs, the patient's level of intoxication will be assessed as very severe, severe, moderate, mild, not intoxicated, or alcohol involved but degree not specified. Although clinical assessment of intoxication will not identify problem drinkers who are not intoxicated at the time of the ED visit, it may prove useful in those countries with limited resources to detect patients with drinking problems.

Screening questionnaires probably hold the most promise for accurate assessment of problem drinking among ED patients. Important considerations in searching for an "ideal" screen, as Dr. Woolard pointed out, include defining the condition or disorder that is being identified (whether dependence, abuse, or harmful or hazardous drinking), performance of the screening instrument across the spectrum of severity of the disorder, the time frame being considered (whether current or lifetime), brevity, ease in remembering and using the screening items, ability to obtain an immediate diagnosis or identification, and biases of screening items in relation to gender and ethnicity. I have found that the search for the "best" screen presents some intriguing research questions in relation to whether there is an "ideal" set of disorder-specific screening questions. Dr. Woolard mentioned the RAPS screen which I developed for use in the ED, and which has now been modified to the four-item RAPS4[1] (Table 1), deleting the question on losing friends because of drinking. Sensitivity of the RAPS4 for alcohol dependence is as high for females (91%) as for males (94%), and it performs equally well across ethnicities (sensitivity of 93% and specificity ranging from 84% for whites to 89% for Hispanics) (Table 2). Sensitivity of the RAPS4 is not as good for identifying harmful drinking or abuse, however (also true of other screening instruments), with sensitivity for females only 65%, and 77% across ethnicities. The first item on the RAPS4, having to do with feeling guilt or remorse after drinking, identifies the majority of those meeting diagnostic criteria for alcohol dependence: 85% of males, 80% of females, 77% of blacks, 83% of Hispanics, and 84% of whites (Table 3). Again, this item is not as sensitive for identifying harmful drinking or abuse, ranging in sensitivity from 56% for females to 71% for males. The RAPS4 appears to meet several criteria for an "ideal" screen. It is simple; no weighting, adding, or scoring of items is required. A positive response on any item qualifies as being positive on the RAPS4.

Since the first question identifies more than 80% of those meeting criteria for alcohol dependence, the remaining questions may not be necessary. It appears to perform equally well across ethnicities and performs notably well among females, which many screening instruments do not.

In the search for the best screen, and to further evaluate the RAPS, I was interested in comparing the RAPS items with the best item set from the same pool of items optimized in a different sample. We used a merged data set from patients in three hospital EDs in Pachuca, Mexico (n=537), and Mexican American patients in the ED in the Santa Clara Valley Medical Center in San Jose, California (n=332).[2] In this sample, the RAPS had a sensitivity of 93% and specificity of 79% (among drinkers only). An item selection procedure known as the tree-based classification method was used to identify the five best screening items from the CAGE, Brief MAST, AUDIT, and TWEAK, based on sensitivity for alcohol dependence using ICD-10 and DSM-IV diagnostic criteria. The tree-based items—not being able to stop drinking, having friends complain about your drinking, feeling a need to cut down on drinking, having friends or a doctor suggest cutting down, and failing to do what was normally expected because of drinking—had a sensitivity of 98% and a specificity of 65%. Only one of the items, failing to do what was normally expected, overlapped with the RAPS items. The RAPS items, which were selected to optimize sensitivity while maintaining good specificity, included two physiological symptoms of dependence, while the tree-based model items were selected to maximize sensitivity without regard for specificity, and included only one physiological symptom. The differing criteria for item selection relating to sensitivity versus specificity may account for the lack of congruence between the two sets of items and suggests, not surprisingly, that consequence-of-drinking items may provide better sensitivity, while physiological items may increase specificity. This is an area of research that may deserve further exploration. Of course, we do not know how well the tree-based model may work in non-Mexican/Mexican American populations or as a stand-alone instrument, and further research is also needed on the RAPS as a stand-alone instrument.

Finally, in relation to the application of screening measures and identification of alcohol use disorders in the ED, the United Kingdom has led the United States in studies of screening and brief intervention

in primary care, and we may have lessons to learn in application processes as well. One instrument which has been used to some extent in the United Kingdom is the Paddington Alcohol Test (PAT).[3] This instrument requires one minute to use and is usually administered by a triage nurse who asks the patient what is the most he will drink in any one day (eight or more units for men and six or more for women is considered positive); if positive, whether he or she drinks at this level more often than once a week; and whether the current attendance in the accident and emergency department is related to alcohol. If the patient scores positive on these items, he or she is referred to the alcohol health worker who is based in the hospital. Having such an individual available for counseling is probably the key to success of this screening and intervention program.

In summary, regardless of what we may find as the best screening instrument, future research will also need to explore the acceptability of the screen for use by ED personnel and the ease of implementation of the screen within the scope of *usual practice* in the ED.

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Table 1.
The Rapid Alcohol Problems Screen (RAPS4)

1.5 During the last year, have you had a feeling of guilt or remorse after drinking? (Remorse)

2.5 During the last year, has a friend or a family member ever told you about things you said or did while you were drinking that you could not remember? (Amnesia)

3.5 During the last year, have you failed to do what was normally expected from you because of drinking? (Perform)

4.5 Do you sometimes take a drink when you first get up in the morning? (Starter)

Table 2.
RAPS4: Sensitivity and Specificity for Alcohol Dependence (ICD–10 and DSM IV) in Santa Clara

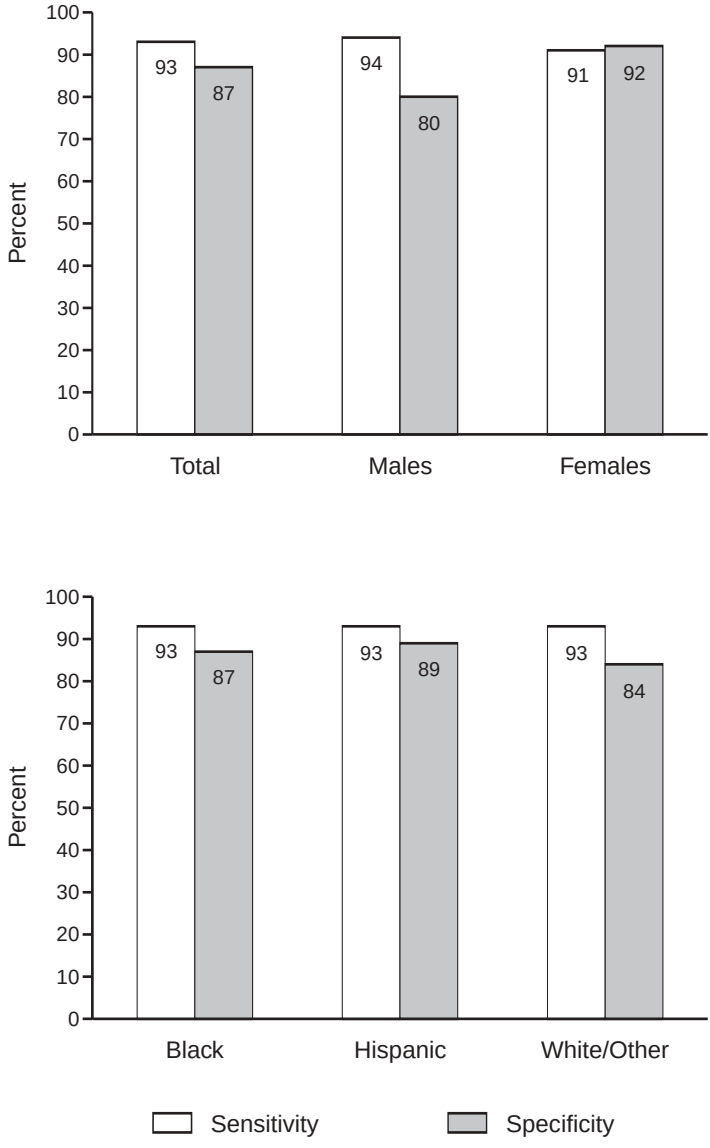
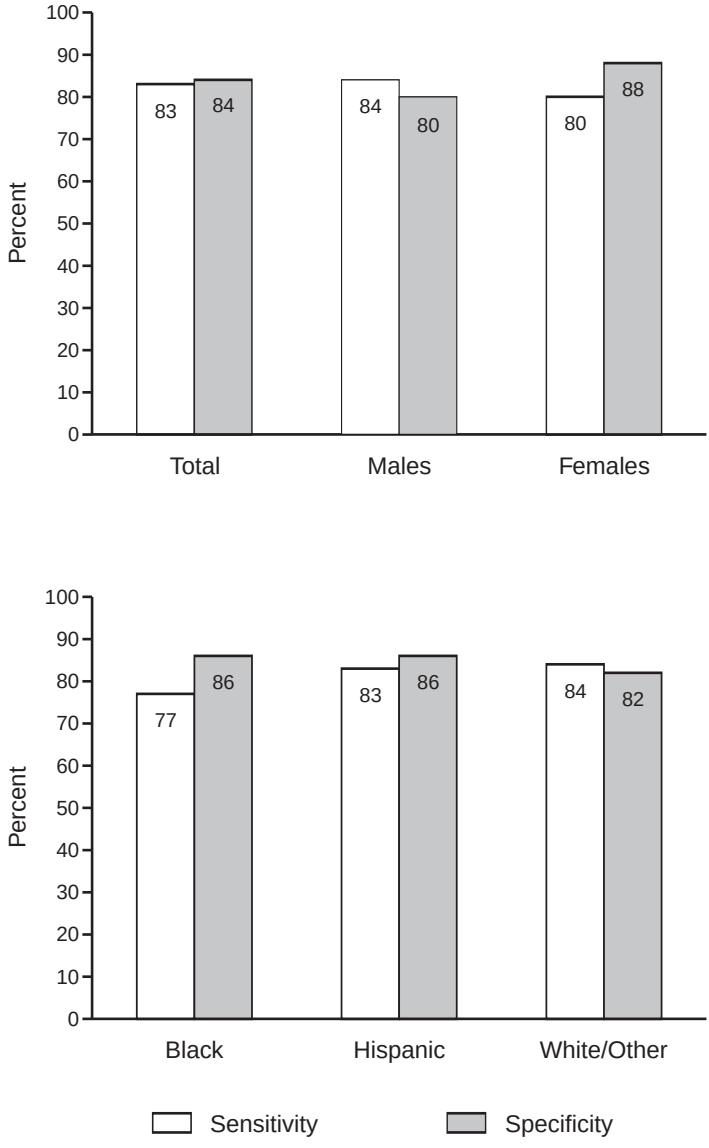


Table 3.
REMORSE: Sensitivity and Specificity for Alcohol Dependence in Santa Clara



Comment on Dr. Woolard's Presentation on Alcohol Screening in Emergency Rooms

Richard L. Brown, MD

Dr. Woolard did a very nice job summarizing some key findings and needs regarding alcohol screening research, and I appreciate the information Dr. Cherpitel added. I will highlight some of the points they made and add some others.

Dr. Woolard emphasized the importance of accuracy, brevity, and practicality of alcohol screening tools. He appropriately described many of the available screening tests, their differential accuracy for different population groups, and the need for additional studies of certain groups. He pointed out an important concern, that researchers have often used different diagnostic interviews in assessing the criterion validity of screening tools. This can make it difficult to compare screening tools for accuracy. Another concern about most research on the validity of alcohol screens is that the screens and diagnostic interviews are usually administered by research staff. This methodology may not tell us enough about the accuracy of screens under actual clinical conditions. Screens may be less accurate when administered by clinicians outside of academic settings, because of stigma, shame, and concerns about confidentiality, judgment, and impact on clinical decisions and future insurability. It would be interesting to compare the results of screens administered by those clinicians with diagnostic interviews administered confidentially by research staff.

Dr. Woolard appropriately emphasized the importance of some practical issues of implementation. Screening can be administered in different ways, such as orally in person, orally over the telephone, in writing, by computer, and by telephone menu systems. Screens can be administered by various health care professionals. As Dr. Woolard said, we do not know what method of administration and which professionals can elicit the most accurate information, especially when screening results will be made available to clinicians.

Dr. Woolard suggested that another important criterion of a good screening test is its motivational value. Indeed, many randomized

controlled trials of brief interventions have shown significant improvement in control groups, perhaps because the screening and assessment procedures foster self-examination. I am not aware of any studies that evaluate whether the administration of brief screens, or simple feedback on the results of such screens, can elicit changes in drinking. Such studies of what might be called super-brief interventions would be interesting.

Questions about whether alcohol screening by itself is motivational remind us that the most important test of the utility of gathering clinical information is whether such information produces better health outcomes. This is best illustrated in the cancer screening literature. Cancer screening techniques are not simply compared against biopsy results. Randomized controlled trials are performed to determine whether individuals who undergo cancer screening live longer than those who do not.[1–3] Although good research exists to show that alcohol screening and intervention programs do reduce harm, and at least one study suggests cost savings, studies showing that alcohol screening prolongs lives might help promote policy changes.

If our goal is to improve health outcomes through alcohol screening, and if we therefore wish to optimize alcohol screening, we must consider how such screening results will be used. Thus, we get back to the issue of an appropriate criterion standard for assessing the accuracy of screens. Many studies have used diagnoses of alcohol abuse and dependence as criterion standards. Such studies have undervalued identifying individuals who are drinking in a hazardous manner and would be responsive to brief interventions. Therefore, screens should certainly be targeted at identifying at-risk drinkers in addition to those with DSM-IV diagnoses of alcohol abuse and dependence.

If we continue thinking about how we can optimize alcohol screening to improve outcomes, we begin to realize that screening could do more than just identify individuals who drink too much. Perhaps quick screens could also help predict patients' responsiveness to different kinds and intensities of interventions or referrals. Screens could help indicate, for example, whether a more confrontational or motivational approach would be more effective. Perhaps screens could also suggest whether the patient would respond better to intervenion staff of certain demographic groups, personality attributes, or professional roles.

So far, I have spoken implicitly about the need to conceptualize screening and intervention as an integrated process. Another need for integration relates to the relationship between alcohol consumption and other health risk behaviors. For example, research has shown that many alcoholics die of tobacco-related diseases. Alcohol dependence and other drug dependence are certainly associated. I have published research on a two-item conjoint screen (TICS),[4] which shows nearly 80% sensitivity and specificity for alcohol or drug abuse or dependence among primary care patients. Alcohol use disorders are interrelated with unsafe sexual behaviors, depression, domestic violence (for both perpetrators and survivors), child abuse, and motor vehicle crashes, to name a few. Clearly, we should be developing and testing multiphasic behavioral screening instruments and programs.

This kind of multiphasic behavioral screening would be especially challenging for emergency departments, whose primary stated purpose, as we heard earlier, is providing excellent, efficient care for acute concerns. Should emergency departments really take on this preventive function? We have already discussed the possibility that visits to emergency departments may be special teachable moments. If this is true, then these opportunities certainly should not be lost. More importantly, in a nation where many individuals' only contact with the health care system is the emergency department, emergency departments *must* provide this preventive care.

The next question is, then, how can emergency departments possibly provide alcohol screening, or multiphasic behavioral screening, and the subsequent interventions? I believe that the answer will be a creative combination of technology and human resources. Interactive computer programs could identify at-risk and problem drinkers, perform brief interventions, and offer referrals. Computers could interact with patients in different languages. They could depict helping professionals of various demographic and cultural groups. They could administer the screening test known to be most accurate for the patient's population group. Emergency department staff could simply provide reinforcement, answer further questions, and assist with referrals. Follow-up care could occur in person or by telephone or e-mail. It is not a great stretch to envision a community-based or managed care–based behavioral risk management system in which emergency departments

are just one of many venues for systematized, computer-based screening, and individuals who need more help are referred to more centralized referral resources. Examples of these systems should be developed and evaluated.

In summary, I would suggest the following research agenda for alcohol screening:

- We need accurate, brief screens for all population groups.
- We need to identify the most effective and efficient ways to administer screens, keeping in mind that there may be variability across population groups.
- We need screens that have demonstrated accuracy, not just as they are administered by researchers, but also as they are administered in clinical settings.
- We would like screens that begin to motivate behavior change.
- It is already clear that screening followed by intervention can reduce harm and perhaps decrease costs. It would be interesting to know whether alcohol screening, like cancer screening, can save lives.
- We need screens that will identify at-risk drinkers as well as individuals with alcohol abuse or dependence.
- We need to develop and test multiphasic behavioral screens. We might start at least with combined alcohol and drug screens.
- We need to develop and test technology, and combinations of technology and human resources, to perform alcohol and other behavioral screening with cultural sensitivity, effectiveness, and efficiency.

It is likely that alcohol screening and subsequent services can be provided in ways that do not hinder emergency departments from addressing their primary mission of providing acute medical care.

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General Discussion

Elinor Walker noted the breathalyzer is not really predictive for alcohol problems, so she asked what "gold standards" are being used to validate screening instruments for alcohol problems.

Cheryl Cherpitel, Richard Brown, and Robert Woolard noted that screening instruments are usually validated against criteria for alcohol abuse, alcohol dependence, or harmful drinking from the Diagnostic and Statistical Manual of Mental Disorders - 4th edition (DSM-IV) or the International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10). These diagnoses are determined by diagnostic interviews that have been developed and validated by a variety of sources. In clinical practice, further interviewing after the screening often confirms a diagnosis.

Cherpitel said the "gold standard" for alcohol dependence includes physiological symptoms as well as behavioral and psychological domains. As the United States continues to gain citizens from other parts of the world, it will be more important to determine if these domains are valid across cultures.

Richard Longabaugh commented that the important criterion for screening should be the likelihood of harm occurring if the patient's behavior does not change. The same behaviors in different cultures can have different consequences, he said, so the practical task is difficult.

Richard Ries pointed out that diagnostic interviews and criteria are artificial gold standards. Neither gathers much information about at-risk people, and people can lie as well in structured diagnostic interviews as they can on screening instruments.

Thomas Babor noted that the diagnostic criteria are sometimes as questionable as the screening tests themselves. Both are based on a clinical model that assumes a patient either has or does not have a condition. That model does not necessarily apply even to physical disorders where there is a continuum of severity, never mind behavioral disorders. To take advantage of screening tests, he suggested that cut-off points along the spectrum will help differentiate between people at the lower end of the spectrum, who are at risk, and people at the higher end, who

most likely have a condition. These points can help ED personnel decide whether a "teachable moment" will help a patient change his behavior or whether a short intervention will not be worthwhile and a referral would be more helpful.

Brown noted that studies show that even many dependent drinkers can cut down or quit drinking without help. Therefore, he questioned the usefulness of grading the severity of a patient's problem in order to decide who should get an on-site intervention and who should be referred for more extensive alcohol treatment. He recommended first trying a brief intervention and then referring a patient after that, if needed.

Gordon Smith noted a study that involved a mistaken re-ordering of screening questions, which yielded a different prevalence estimate. He asked the panel to address the issue of the effect of ordering test questions.

Woolard noted one study showing that if the CAGE is administered after the consumption questions, its sensitivity is lower.

Brown commented that asking quantity and frequency questions first often results in patients becoming defensive if the answers are high. Then they are not comfortable answering questions about alcohol-related harm.

Babor added that the literature does not show that ordering of questions has a large degree of influence. Questions about alcohol consumption should logically be asked before questions about consequences or symptoms. If a patient does not drink alcohol, the other questions are not applicable.

Woolard recommended that future testing of questionnaires should be done in conjunction with interventions in order to evaluate which combinations of screening instrument and intervention are most effective and efficient.

Alison Moore advocated more research on screening measures for identifying alcohol problems among older people because current screening measures have not been reliable, and alcohol can interact

with the large number of medications they take. The DSM and ICD criteria may be less relevant in this age group. In addition, the legal and social consequences of alcohol abuse often used in screening instruments are different for older people.

Brown responded that pharmacists can be of great help in the issues of medication interactions among the elderly. Pharmacists are expected to conduct patient education, which can include identifying patients who are being prescribed potentially addictive medications or medications intended for conditions that are often related to alcohol.

Woolard noted that lower levels of alcohol consumption can produce problems for older adults. Since many questionnaires focus on lifetime experience, older persons have a very high likelihood of replying in the positive, which may lead to false positives when looking at current problems. The ED serves such a broad variety of patients, a computer that asks the patient's age and then produces appropriate questions might be the best way to screen.

Mary Dufour commented that some combinations of over-the-counter and prescription medicines that older people may take can lead to adverse drug interactions and ED visits.

Bruce Becker inquired about the chronology of the issues related to drinking and the screening questions. He asked the panelists to comment on whether, in terms of the ED, a 1-month, 6-month, or 12-month prevalence of drinking behavior would be the most relevant. He also asked why Dr. Cherpitel chose the time frame of "in the last year" for the Rapid Alcohol Assessment Screen (RAPS), and he wondered whether a shorter time frame might be more effective in the acute, ED setting while the longer time frame applies to a survey situation.

Brown responded that any time frame can be relevant. Information about current drinking can identify patients with active problems or risks, and the past history of dependence can be useful in identifying patients who are at risk for a relapse or might develop addictions to prescribed medications.

Cherpitel replied that she had not analyzed data to inform her choice of time frame. She noted that in national surveys, respondents are routinely

asked for drinking episodes over their lifetime and in the last 12 months, so it seemed like a standard in the field.

Woolard added that a recent trauma center study used acute intoxication as the criterion for alcohol problems rather than screening questions. Patient outcome was more closely associated with results of the screening interview than the presence of acute intoxication. From the emergency perspective, a year seems like a long time frame for questions about drinking, but at some point, both long- and short-term use of alcohol are factors.

David Fiellin noted that there were tests with good operating characteristics and that 20% of primary care doctors use screening instruments. However, he suggested that getting screening to take place in the ED is a more important research issue than quantifying performance characteristics of specific screens.

Woolard agreed that the question of how to implement screening was crucial and that some tests may be more acceptable than others.

Larry Gentilello commented that trying to discover the best screening test or the best single question might be too abstract. The best tool depends on the projected treatment, the particular type of patient, and what a particular hospital can offer.

Woolard agreed that research on the sequence of test-intervention-outcome is important. However, because so many screens are available, projects will also need more information about them to match the right one to their local conditions and needs.

Fred Blow noted that personal digital assistants can increase the efficiency of screening and interventions. They can rapidly segment the population so that different screening questions can be asked of patients by age, gender, and level of risk. Brief interventions can then be focused on the level of risk or the segment of the population.

Gail D'Onofrio noted that all screening questions do not have to be asked of all patients because 40% of the population does not drink. She added that information technology can be used to automate alcohol screening in the ED.

Phillip Brewer noted that ED staff may be pressed for time, but the patient has plenty of time and might welcome the diversion of a computerized intervention. He cited the potential efficiency advantages of computerized screening. It could automatically generate a document for a patient to keep and medical staff to use as a tool for follow-up. Different languages can be used, and the ability to read would not be required. He recommended that future research should determine if computer technology and data information systems could be used to screen systematically without hiring more people.

Woolard agreed, citing activities that used to be labor-intensive and are now automated and self-administered, such as withdrawing money from the bank or putting gasoline in a car. The same phenomena could occur in the ED. Pilot studies have been successful when patients interacted with laptops or hand-held computers.

Ries mentioned that some patients are too intoxicated or too injured to be included in studies. He approved of using information technology, but said a research agenda should address patients who are not able to respond to computers.

Ronald Maio asked whether the research agenda should include a focus on prevention of medical errors and injuries among intoxicated patients.

Woolard noted that no other clinical medical practice sees such a high percentage of acutely intoxicated patients.

Brown stated that performing an intervention on an intoxicated patient is unlikely to have an impact. He described pilot studies that suggest that telephone interventions are effective with patients who are screened in primary care waiting rooms and wondered whether that kind of intervention could be extended to intoxicated patients once they are sober and released from the ED.

D'Onofrio commented that only about 5% of patients are dependent on alcohol. Since intoxicated patients are so disruptive, a vast amount of time is spent on them in the ED. She recommended we focus on other patients at risk for alcohol problems because brief interventions work well with them. Patients with severe problems should get a referral.

Cherpitel noted that the proportion of ED patients who are alcohol-dependent varies greatly. In EDs where there is a high rate of dependence, almost everyone would screen positive which could overload the referral or intervention system. Specific clientele and resources come into play when making decisions, she said.

Brown suggested that pessimism about interventions for alcohol problems that many health care professionals have may stem from the fact that only end-stage dependent patients tend to be recognized. If physicians can experience identifying someone early on and see that they can make a difference, then there might be less pessimism.

Edward Bernstein noted that ED personnel other than nurses and physicians can do the screening and interventions. He suggested that implementation research can evaluate different approaches. One approach could involve a computer kiosk that embeds alcohol questions in a general health screen and prints out results with educational material. Another approach could use health promotion advocates that interact with patients directly. Another approach is to have physicians questioning patients about health practices when collecting medical history. A triage approach could use a checklist on intake forms.

Woolard commented that when talking about implementing screening in the ED, the question is always, "What staff will do it?" A model that is not limited to alcohol, but screens for a wide variety of health issues, might have a better chance of funding.

Linda Degutis said a recent survey of emergency nurses and physicians in Connecticut found that they usually ask their patients about alcohol consumption or problems, but fewer than 25% used screening tools. About 20 years ago, the Yale ED evaluated whether prompts on medical records increased compliance with recommended practices. Practitioners who received feedback were more likely to comply. She recommended applying this concept to alcohol screening.

Woolard noted that education remains the key. Medical school and residency programs should reinforce the CAGE, for instance, and embed those questions into existing documentation.

Brown said that medical students and residents often try to ask patients about alcohol, but they do not know what questions to ask. With a structured approach, they can ask more questions and do more good.

Patricia Perry wondered whether patients would get a brief intervention from the person who did the screening or from someone else. She said the answer to that question would change the kind of screening needed.

Woolard replied that whatever option was chosen, future research on screening should focus on screening that is linked to interventions. He noted that another option would be to use more sophisticated, less labor-intensive general screening, which could be executed through computer.

Becker observed that screening itself can act as an intervention. In one smoking study, patients in the control group thought that they were in the intervention group, and vice versa. When screening is paired with an intervention, how can the intervention effects be separated?

Woolard added that just the visit to the ED could motivate change.

Cherpitel agreed that this is an evaluation problem for researchers. However, if a patient thinks that the screening is an intervention, then there has been an intervention.

Brown noted that one possibility would be to use a comparison group from another ED where this research is not going on.

Kristen Barry noted that she and her colleagues had been concerned about this issue so they randomized patients into either a brief assessment or a more extensive assessment. Length of assessment did not produce differences in how many patients reduced their drinking. From a clinical standpoint, she said that if screening shows a behavior change in the people that are being screened, it is not necessarily a bad outcome, even though clinical trials are not helped.

Peter Rostenberg commented that physicians underestimate the power of their advice and their interactions with their patients. Shorter screens, he said, are key if they are going to be integrated into the history assessment.

Carlo DiClemente wondered if the group was not asking too much of screening. The screening is as much for which patients do not require further intervention as it is for patients who are identified. Screening should be an opportunity to begin a conversation, not an ultimate tool.

Peter Monti commented that for the most part, the pure and simple alcoholic does not exist anymore. Most patients are abusing multiple substances, he said, and screens must be developed and linked with interventions with this fact in mind. Brief interventions have been found to be effective with a number of substance abuse problems, he said, including marijuana and nicotine dependence.