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## A Survey of Screening & Intervention for Comorbid Alcohol, Drugs, Suicidality, Depression & PTSD at Trauma Centers

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### Abstract

**Objective**—Comorbid mental health and substance use problems are endemic among injured trauma survivors. The American College of Surgeons has mandated alcohol screening and brief intervention at trauma centers and is anticipated to produce best practice policy guidelines recommendations for drug screening and posttraumatic stress disorder (PTSD). Few investigations, however, have examined screening and intervention procedures for the full spectrum of comorbid mental health and substance use conditions at United States (US) trauma centers.

**Method**—Trauma programs at all US Level I and Level II trauma centers were contacted and asked to complete a survey describing screening and intervention procedures for alcohol and drug use problems, suicidality, depression, and PTSD.

**Results**—Three hundred and ninety-one of 518 (75%) of US Level I and II trauma centers responded to the survey. Over 80% of Level I and II trauma centers reported routinely screening for alcohol and drugs. As anticipated by current American College of Surgeons policy, Level I centers were significantly more likely to provide alcohol intervention when compared to Level II centers. The frequencies of routine trauma center screening and intervention for suicidality, depression, and PTSD was markedly lower; only 7% of centers reported routinely screening for PTSD.

**Conclusions**—Alcohol screening and intervention occurs frequently at US trauma centers and appears to be responsive to American College of Surgeons policy mandates. Future orchestrated clinical investigation and policy could productively address screening and intervention procedures for comorbid PTSD, depression, and suicidality.

### Introduction

Recent commentary and investigation has emphasized the importance of integrating mental health and substance use screening and intervention services within general medical settings (1-3). To date, the majority of investigation and commentary regarding integration has been

devoted to the development of mental health and substance use services in primary care medical settings (1-8).

Prior investigations have established high rates of mental health and substance use comorbidity among patients presenting to acute care medical emergency department and trauma center settings (9-13). Soderstrom et al. (10) reported that 54% of injured inpatients had a current or lifetime alcohol and drug abuse/dependence diagnosis. A series of investigations have documented rates of posttraumatic stress disorder (PTSD) and depression of 20-40% among injured trauma survivors over the course of the year after acute care medical trauma center admission (9, 12, 14). More recent investigation suggests high rates of occult suicidal ideation among injury survivors above and beyond the frequent presentation at trauma centers of patients with self-inflicted injuries (15-19). In acute care medical settings, mental health and substance use disorders negatively impact key functional outcomes and health service utilization (20, 21).

In 2006, in response to a series of investigations establishing the efficacy and effectiveness of alcohol screening and brief intervention for injured patients, the American College of Surgeons mandated alcohol screening and brief intervention services at United States (US) trauma centers (22). Level I trauma centers were required to have both a mechanism to screen and intervene for injured patients with alcohol use problems. The mandate also required Level II trauma centers to screen injured patients for alcohol but did not require they intervene.

Prior to the mandate implementation, Terrell et al. (23) found that alcohol screening was fairly routine at Level I trauma centers, with about 70% conducting a blood screen, but only about 40% using evidence-based interventions following a positive screen. Literature review, however, revealed no investigations that have reassessed alcohol screening practices at Level I or II trauma centers since the US nationwide mandate implementation. Also, recent commentary has considered expansion of screening and intervention recommendations beyond alcohol to other comorbid conditions such as PTSD at trauma centers (24, 25). Despite the high prevalence and frequent comorbid presentations of alcohol and drug use disorders with PTSD, depression and associated suicidal ideation, literature review revealed few comprehensive assessments of current screening and intervention procedures at acute care medical trauma centers(26).

This investigation aimed to assess current screening and intervention practices for alcohol and related comorbidities, including drugs of abuse, PTSD, depression, and associated suicidal ideation at US Level I and Level II trauma centers. The investigation hypothesized that Level I trauma centers would have greater penetration of and enhanced alcohol screening and intervention procedures when compared to Level II trauma centers. Exploratory analyses assessed whether any observed service delivery enhancements at Level I trauma centers would extend to other comorbid mental health and substance use disorders.

## Methods

### Participants

All Level I and II trauma centers in the US were identified through a review of the American College of Surgeons' listing of verified trauma programs, the American Trauma Society's Information Exchange information system, and other web-based searches (23, 27, 28). Informational data on hospital accreditation, academic affiliation, and bed number were obtained from American Hospital Directory listings and through review of individual hospital web pages. These public information data sources were utilized in conjunction with hospital web-sites to identify potential trauma program survey responders. Because the survey aimed to assess psychosocial screening protocols for alcohol, PTSD, and other related psychiatric comorbidities at the organizational level, trauma center staff, such as trauma program coordinators, were identified for contact. Trauma center staff who were identified at each trauma center were sent an initial email introducing the survey and inviting them to participate. If the contacted staff member did not complete the survey, or respond to the invitation email declining to participate within one week, the study team followed up with two more reminder emails. If after three emails there was still no response, a research assistant from the study team made three attempts by phone to contact the trauma center staff member to recruit them to the survey. If after three phone calls there was no success, the study team discontinued to contact a site unless a new contact was identified at the site (i.e. the study team found out the trauma center staff member identified no longer worked at the site or had switched departments or roles). The University of Washington Institutional Review Board approved all study procedures prior to protocol implementation. After complete description of the study to the participants, informed consent was obtained. Providers were reimbursed \$30 after completion of the questionnaire.

### Development of the Survey

A questionnaire was developed to assess Level I and II trauma center alcohol, drug, PTSD, depression, and suicide screening and intervention practices. Selected items were adapted from an instrument previously developed by the investigative group to assess nationwide alcohol screening and brief intervention practices (23). For each presentation (i.e., alcohol, drugs, suicide, depression, PTSD) the investigation assessed screening practices and the percentage of injured patients screened. The investigation also assessed hospital-based intervention and referral practices, including the nature and extent of hospital-based intervention, the providers involved in the intervention, and referral and staffing practices.

### Data Analyses

We first examined the frequencies and distributions of organizational characteristics for all US Level I and Level II trauma centers, including the frequencies and distributions of survey items including American College of Surgeons verification, geographic location (region of the county and rural status), teaching status (teaching hospital status, membership in council of teaching hospitals, number of interns/residents), population served (adult, pediatric or combined), and number of hospital beds and injury admissions per year. We then used  $\chi^2$ , t-tests, and Fisher's exact test statistics to compare the characteristics of responding and non-responding sites. Next, descriptive characteristics of screening and intervention programs

were assessed as were potential differences between Level I and Level II trauma center sites. When Level I and Level II trauma centers were found to significantly differ with regard to screening and intervention procedures, multivariate logistic regression models were run that included trauma center level as well as trauma center organizational characteristics as independent variables. Significant differences between Level I and Level II trauma centers that remained after adjustments for organizational characteristics are reported.

## Results

### Trauma Center Characteristics

Three hundred and ninety-one of the 518 US Level I and II trauma centers responded to the survey (75%); 18 trauma centers could not be contacted, 35 trauma centers refused, and 74 trauma centers did not complete the survey. Responding trauma centers were similar to non-responding centers with the following exceptions; responding centers were more likely to be from the Midwest whereas non-responding centers were more likely to be from the Northeast (Table 1). Provider respondents were predominately female (82%) and from nursing backgrounds (91%). Ninety-one percent of providers self-identified their ethnic/racial background as Caucasian, 4% as Hispanic, 2% as Asian, 2% as African American, and 1% as American Indian.

Overall, greater than 80% of Level I and II trauma centers reported routinely screening for alcohol and drugs. Over 90% of trauma centers reported routine screening for alcohol with either a laboratory test or a questionnaire (Table 2). For centers using laboratory tests to screen for alcohol the most frequently used test was blood/serum alcohol concentration (78%) followed by urine screens (36%); all other methods were less than 10%. For centers that used questionnaires to screen for alcohol the most frequently endorsed questionnaire was the CAGE questionnaire (36%), while all other screens, including the Alcohol Use Disorders Identification Test (AUDIT), were used less than 10% time. When injured patients were alcohol screen positive on a laboratory test or questionnaire, 4% of centers reported doing nothing and 45% of centers reported having an informal discussion with patients. Forty-eight percent of trauma centers reported having a formal consult for patients screening positive for alcohol (Table 2). The consult was most frequently conducted by a social worker (67%), followed by registered nurses (21%), and chemical dependency counselors (21%). When conducting consults, 64% of sites reported also assessing for concurrent psychosocial problems/issues, 49% reported using evidence-based counseling techniques, such as motivational interviewing, and 71% reported referring patients to specialized alcohol treatment services. Twenty-one percent of centers reported having dedicated staff support for individuals conducting alcohol screening and brief intervention services.

Eighty-three percent of trauma centers reported routine screening for drugs of abuse (Table 2). For centers using labs to screen for drugs the most frequently used test was blood/serum drug concentration (52%) followed by urine screens (41%); all other methods were used less than 10% of the time. Among centers that used questionnaires to screen for drugs, no single questionnaire was used more than 10% of the time. When patients were either laboratory or questionnaire drug screen positive, 9% of centers reported doing nothing and 36% of centers

reported having an informal discussion with patients. Thirty-five percent of trauma centers reported calling a formal consult for patients screening positive for drugs use. These consults were most often conducted by social workers (63%), followed by chemical dependency counselors (22%), psychiatrists (16%), nurses (14%), and psychologists (11%). Eighty-two percent of trauma centers reported that the same person who was called to consult for alcohol use problems was also called for consultation in patients with drug use problems. When conducting consults, 56% of sites reported also assessing for psychosocial issues, 38% reported using evidence-based counseling techniques, and 59% reported referring patients to specialized drug abuse services. Eighteen percent reported having dedicated staff support for drug screening and intervention.

Forty-nine percent of trauma centers reported screening for suicide (Table 3). No single questionnaire was consistently reported being used for suicide screening. In the event a consult was called for a suicidal patient, 49% of trauma centers reported that a psychiatrist performed the consult, 27% reported social workers, 22% reported psychologists, and all other staff persons were reported to perform consults for suicide less than 10% of the time. Twenty-eight percent of trauma centers reported that the same person who did the consult for alcohol also did the consult for suicide, and 47% reported that the person who did the consult for suicide also consulted for PTSD and depression.

Twenty-three percent of trauma centers reported screening for depression (Table 3). No single questionnaire was consistently reported being used for depression screening. In the event of a consult, 38% of trauma centers reported it was the responsibility of a psychiatrist, 26% reported a social worker, 21% reported a psychologist; all other staff persons performed depression consults under 10% of the time. Twenty-four percent of trauma centers reported that the same person who performed a consult for alcohol use problems also did the consult for depression, and 42% reported that the person who did the consult for depression also performed the consult for co-occurring problems, such as PTSD.

Only 7% of trauma centers reported screening for PTSD (Table 3). In the event of a consult, 25% of trauma centers reported the consult was performed by a social worker, 24% reported a psychiatrist, 15% reported a psychologist; all other staff persons were reported to perform PTSD consults under 10% of the time.

After adjustments for organizational characteristics, Level I trauma centers were significantly more likely to use questionnaire-based screening procedures and have an intervention available for alcohol use problems. Level I centers in comparison to Level II centers were also significantly more likely to have available evidence-based bedside counseling for alcohol and drug use problems. With regard to PTSD, Level I centers reported being significantly more likely to provide bedside counseling and evidence-based therapy. In contrast, after adjustments for organizational characteristics, Level II trauma centers were more likely to use a laboratory test to screen for either alcohol or drug use problems, and were more likely to routinely screen for depression.

## Discussion

Each year in the US, millions of American present to acute care medical settings after incurring traumatic physical injuries. Injured trauma survivors present with multiple comorbid mental health and substance use problems. Level I and II trauma centers are required by the American College of Surgeons to provide the highest quality injury care (22). The American College of Surgeons has mandated that Level I and II centers screen for alcohol use problems and that Level I centers have the capacity to provide an intervention for screen positive patients.

Literature review suggests that this is the first investigation to assess the impact the mandate has had on screening and intervention practices at US Level I and II trauma centers. With 75% of trauma centers responding to the survey, it appears that the mandate has influenced the care injured patients are receiving for their alcohol use problems. Prior to the mandate, 79% of trauma centers reported screening their patients for alcohol through either a laboratory test or questionnaire (23). Now, over 90% of Level I and II trauma centers are screening their patients for alcohol through either a laboratory test or questionnaire. Nearly 65% of Level I trauma centers are conducting some sort of evidence-based intervention which is an increase from the 41% reported prior to the mandate implementation (23). As required by the mandate, Level I centers appear to be significantly more likely to provide interventions for alcohol use problems. Given the increasing body of evidence suggesting the effectiveness of alcohol screening and brief intervention at trauma centers a next logical step could be to expand the mandate to require both screening and intervention at Level II centers.

With regard to screening for drugs of abuse, the investigation found overall high rates of screening nationally. Surprisingly, Level II centers appear to be screening at a greater frequency than Level I centers. This high rate of screening for drugs at both Level I and II trauma centers may be attributed to the observation that mandated alcohol screening through either laboratory testing or questionnaires is already taking place. It appears, however, that fewer Level I and II sites are currently providing interventions for drug screen positive injured patients.

For suicidality, depression, and PTSD the investigation has documented markedly lower frequencies of systematic screening and intervention procedures. Of particular note, only 7% of Level I and II trauma centers reported routinely screening for PTSD. Previous studies have demonstrated the effectiveness of PTSD screening and intervention at trauma centers (25, 29). The adoption of population-based automated screening procedures for PTSD could enhance the efficiency of PTSD screening procedures thus expanding reach and overall population impact at US trauma centers (30-32). These methods could be honed to enhance screening rates for the full spectrum of comorbidities including depression. Finally, the American College of Surgeons ability to mandate screening and intervention procedures offers a modicum of stability in an otherwise markedly fluctuating US health care system.

This investigation has limitations. Trauma program coordinators were contacted to complete the questionnaire with the belief that they would have a comprehensive knowledge on their



trauma centers“ screening and intervention practices. It could be that at some sites, there are more knowledgeable individuals for questions related to mental health and substance abuse screening and intervention procedures. Also, while observations regarding screening and intervention practices described in this paper may be temporally associated with American College of Surgeons policy recommendations, the study cannot rule out the possibility that multiple other factors contributed to observed changes in trauma center screening and intervention practices, since mandate implementation.

## Conclusion

Integration of treatment for comorbid mental health and substance use problems into US trauma care systems has advanced considerably over the past decade. The American College of Surgeons has influenced movement towards integration with mandates for alcohol screening and brief intervention. The results of this investigation document that alcohol screening and intervention occurs frequently at US trauma centers and appears to be responsive to American College of Surgeons policy mandates. Future orchestrated clinical investigation and policy could productively address screening and intervention procedures for highly prevalent, comorbid PTSD, depression, and suicidality.

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**Table 1**

Organizational Characteristics of Responding &amp; Non-Responding US Trauma Centers (N=518)

Characteristic	Responders (n=391)		Non-responder (n=127)		P
	n	%	n	%	
Trauma Center Level					.28
Level I (n=221)	172	44	49	39	
Level II (n=297)	219	56	78	61	
ACS <sup>a</sup> accredited	184	47	49	39	.18
Region of country					<.05
Midwest	156	40	37	29	
South/Southeast	44	11	19	15	
Northeast	86	22	41	32	
West	90	23	29	23	
Central	15	4	1	1	
Rural status	68	17	26	21	.43
Population served					.91
Adult	275	70	92	72	
Adult and pediatrics	85	22	25	20	
Pediatrics	29	7	9	7	
Missing	2	1	1	1	
Teaching hospital	274	70	79	62	.18
Council of teaching hospitals	161	41	47	37	.50
University affiliation	319	82	102	80	.77
Number of interns/residents (M±SD)	173±219		240±355		.08
Number of hospital beds (M±SD)	460±265		474±318		.66
Number of inpatient admissions (M±SD)	22615±12011		20031±11986		.05

<sup>a</sup>ACS, American College of Surgeons<sup>b</sup>SD, standard deviation

Alcohol and Drug Screening, Brief Intervention and Referral to Treatment at US Level I (N=172) and Level II (N=219) Trauma Centers

Table 2

Characteristic	Alcohol												Drugs											
	Total			Level I			Level II			Total			Level I			Level II								
	N	%	P	N	%	P	N	%	P	N	%	P	N	%	P	N	%	P						
% of trauma centers routinely screening																								
Labs	314	80	<.05	128	74		186	85		297	76		119	69		178	81		<.05					
Questionnaire	265	68	<.05	132	77		133	61		125	32		60	35		65	30		.27					
Lab or questionnaire	367	94	.14	158	92		209	95		325	83		137	80		188	86		.10					
Median % (IQR) <sup>a</sup> of patients screened at each trauma center																								
Labs	62.5	46		62	50		65	45		60	58		60	50		60	65		.37					
Questionnaire	80	50		75	67		90	50		75	79		80	69		73.5	97		.33					
Median % (IQR) of patients formal consult intervention	90	50		90	40		87.5	50		90	71		90	40		75	80		.21					
% of elements of formal consult																								
Further psychosocial assessment	250	64		118	69		132	60		220	56		99	58		121	55		.65					
Evidence-based bedside Counseling such as MI <sup>b</sup>	190	49		110	64		80	37		147	38		81	47		66	30		<.05					
Treatment referral	279	71		126	73		153	70		231	59		111	65		120	55		.05					
Any intervention	326	83		155	90		171	78		280	72		127	74		153	70		.39					

<sup>a</sup>IQR, interquartile range

<sup>b</sup>MI, motivational interviewing

**Table 3** Suicide, Depression & PTSD<sup>a</sup> Screening & Intervention at US Level I (N=172) and Level II (N=219) Trauma Centers

Characteristic	Suicide						Depression						PTSD					
	Level I		Level II		P		Level I		Level II		P		Level I		Level II		P	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
% of trauma centers routinely screening	74	43	118	54	<.05	31	18	60	27	<.05	12	7	17	8	.77			
Median % (IQR) <sup>b</sup> of patients screened at each trauma center	100	40	100	10	.56	92.5	80	95	50	.79	60	55	50	85	.22			
% of patients receiving an intervention																		
Medication	101	59	129	59	.97	92	54	127	58	.37	63	37	63	29	.10			
Bedside counseling	97	56	132	60	.44	89	52	109	50	.70	75	44	73	33	<.05			
Evidence-based therapy	73	42	98	45	.65	61	36	72	33	.59	49	29	40	18	<.05			
Any intervention	112	65	161	74	.07	107	62	145	66	.41	90	52	107	49	.5			

<sup>a</sup>PTSD, posttraumatic stress disorder

<sup>b</sup>IQR, interquartile range