

Screening and Intervention for Comorbid Substance Disorders, PTSD, Depression, and Suicide: A Trauma Center Survey

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Objective: Few investigations have examined screening and intervention procedures for comorbid substance use and mental disorders at trauma centers in the United States, although these disorders are endemic among survivors of traumatic injury. In 2006, the American College of Surgeons (ACS) mandated that level I and level II trauma centers screen for alcohol use problems and that level I centers provide brief intervention for those who screen positive. The ACS is expected to recommend best practice policy guidelines for screening for drug use problems and posttraumatic stress disorder (PTSD). This study examined screening and intervention procedures for the full spectrum of comorbid mental and substance use disorders at U.S. trauma centers. **Methods:** Respondents at all level I and level II trauma centers (N=518) in the United States were asked to complete a survey describing screening and intervention procedures for alcohol and drug use problems, suicidality, depression, and PTSD. **Results:** There were 391 (75%) respondents. Over 80% of trauma centers routinely screened for alcohol and drug use problems. Routine screening and intervention for suicidality, depression, and PTSD were markedly less common; in fact, only 7% of centers reported routine screening for PTSD. Consistent with ACS policy, level I centers were significantly more likely than level II centers to provide alcohol intervention. **Conclusions:** Alcohol screening and intervention occurred frequently at U.S. trauma centers and appeared to be responsive to ACS mandates. In the future, efforts to orchestrate clinical investigation and policy could enhance screening and intervention procedures for highly prevalent, comorbid mental disorders. (*Psychiatric Services* 65:918–923, 2014; doi: 10.1176/appi.ps.201300399)

The integration of screening and intervention services for mental and substance use disorders within general medical settings is increasingly viewed as an important goal (1–3). To date, a majority of investigation and commentary regarding integration has been devoted to the

development of services for treatment of mental and substance use disorders in primary care medical settings (1–8).

Patients presenting to acute care medical emergency departments and trauma centers have high rates of comorbid mental and substance use disorders (9–13). Soderstrom and colleagues (10)

reported that 54% of injured inpatients had one or more current or lifetime diagnoses of alcohol or drug abuse or dependence. Between 20% and 40% of individuals who were treated at an acute care medical trauma center for a traumatic injury experienced post-traumatic stress disorder (PTSD) and depression during the year after admission (9,12,14). More recent investigation suggests that rates of occult suicidal ideation among trauma center patients who survive injury may exceed suicidal ideation among patients with self-inflicted injuries (15–19). In acute care medical settings, mental and substance use disorders have a negative impact on 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 (ACS) mandated alcohol screening and brief-intervention services at U.S. trauma centers (22). Level I trauma centers are required to have a mechanism both to screen for alcohol use problems among injured patients and to intervene if a problem is discovered. Level II trauma centers are currently required to screen for alcohol use problems but are not required to intervene.

Terrell and others (23) found that alcohol screening was fairly routine at level I trauma centers before the mandate's implementation, with about 70% conducting a blood screen, but that only about 40% of the centers used evidence-based interventions after a positive screen. A literature review,

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however, revealed no investigations that had reassessed alcohol screening practices at level I or II trauma centers since implementation of the nationwide mandate. Some research has considered the benefits of expansion of screening and intervention at trauma centers to other comorbid conditions such as PTSD (24,25). Despite the high prevalence and frequent comorbid presentations of alcohol and drug use disorders with PTSD, depression, and associated suicidal ideation, however, the 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 use disorders and related comorbid disorders, such as drug abuse and dependence, PTSD, depression, and associated suicidal ideation at level I and level II trauma centers in the United States. The investigation hypothesized that level I trauma centers would have greater penetration of and enhanced procedures for alcohol screening and intervention compared with level II trauma centers. Exploratory analyses assessed whether any service delivery enhancements observed at level I trauma centers extended to other mental and substance use disorders.

Methods

Development of the survey

A questionnaire was developed to assess screening and intervention practices related to alcohol and drug use problems, PTSD, depression, and suicide at level I and II trauma centers. Selected items were adapted from an instrument developed previously by the investigative group to assess nationwide alcohol screening and brief intervention practices (23). For each presenting problem, 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 an existing hospital-based intervention, the providers involved in an established intervention, and types of referral and staffing practices in place.

Participants

Between August 2011 and July 2012, all level I and II trauma centers (N=518) in the United States were identified through the ACS list of verified trauma programs, the American Trauma Society's Trauma Information Exchange Program, and other Web-based searches (23,27,28). Information on hospital accreditation, academic affiliation, and number of beds were obtained from the American Hospital Directory and through a review of individual hospitals' Web pages. Combined, these public data sources were utilized to identify potential trauma program survey responders.

Because the survey aimed to assess protocols for psychosocial screening at the organizational level, trauma center staff, such as trauma program coordinators, were identified for contact. The trauma center staff identified at each trauma center were sent an initial e-mail introducing the survey and inviting them to participate. If the contacted staff member did not complete the survey or did not decline to participate within one week, the study team followed up with two more reminder e-mails. If there was still no response after three e-mails, a research assistant from the study team made three attempts to contact the trauma center staff member by phone to recruit them to the survey. If after three phone calls there was no success, the study team discontinued efforts to contact a site unless a new contact was identified, usually after the study team discovered that the trauma center staff member identified earlier 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.

Data analyses

We first examined the frequencies and distributions of organizational characteristics of all U.S. level I and level II trauma centers, including verification by the ACS, geographic location (region of the country and rural status),

teaching status (teaching hospital status, membership in council of teaching hospitals, and number of interns and residents), population served (adult, pediatric, or combined), and number of hospital beds and injury admissions per year. We then used chi square tests, t tests, and Fisher's exact tests to compare the characteristics of responding and nonresponding sites. Next, we compared descriptive characteristics of screening and intervention programs at level I and level II trauma center sites.

Multivariate logistic regression models were run to compare differences in screening and intervention procedures at level I and level II trauma centers after adjustment for organizational characteristics. The models included trauma center level as well as organizational characteristics as independent variables.

Results

A total of 391 (75%) level I and II trauma centers responded to the survey; 18 trauma centers could not be contacted, 35 refused to participate, and 74 did not complete the survey. Responding and nonresponding trauma centers were similar, except responding centers were more likely to be from the Midwest and nonresponding centers were more likely to be from the Northeast (Table 1). The respondents were predominantly female (N=319, 82%) and from nursing backgrounds (N=362, 93%); 357 (91%) self-identified as Caucasian, 14 (4%) as Hispanic, 7 (2%) as Asian, 6 (2%) as African American, and 2 (1%) as American Indian.

Overall, greater than 80% of level I and II trauma centers routinely screened for alcohol and drug use problems. Over 90% of trauma centers routinely screened for alcohol with either a laboratory test or a questionnaire (Table 2). For centers using laboratory tests to screen for alcohol, blood or serum alcohol concentration was the test used by the most centers (N=304, 78%), followed by urine screens (N=141, 36%). All other methods were used by less than 10% of centers. For centers that used questionnaires to screen for alcohol use problems, the CAGE questionnaire was endorsed by the most centers (N=142, 36%), and no other screen,

Table 1

Organizational characteristics of 518 trauma centers, by survey response

Characteristic	Survey response				p
	Yes (N=391)		No (N=127)		
	N	%	N	%	
Level					.28
I (N=221)	172	44	49	39	
II (N=297)	219	56	78	61	
ACS accredited ^a	184	47	49	39	.18
Region					<.05
Midwest	156	40	37	29	
South or Southeast	44	11	19	15	
Northeast	86	22	41	32	
West	90	23	29	23	
Central	15	4	1	1	
Rural	68	17	26	21	.43
Population served					.91
Adult	275	70	92	72	
Adult and pediatric	85	22	25	20	
Pediatric	29	7	9	7	
Missing data	2	1	1	1	
Teaching hospital	274	70	79	62	.18
CTH member ^b	161	41	47	37	.50
University affiliation	319	82	102	80	.77
Interns and residents (M±SD)	173±219		240±355		.08
Hospital beds (M±SD)	460±265		474±318		.66
Inpatient admissions (M±SD)	22,615±12,011		20,031±11,986		.05

^a ACS, American College of Surgeons^b CTH, Council of Teaching Hospitals

including the Alcohol Use Disorders Identification Test, was used by more than 10% of the centers.

When injured patients screened positive for alcohol on a laboratory test or questionnaire, according to the respondents, 4% (N=14) of the centers did nothing, 45% (N=177) had an informal discussion with the patient, and 48% (N=187) had a formal consult with the patient performed by a hospital staff member specially trained in the topic. The respondents (N=261, 67%) reported that the consult was most frequently conducted by a social worker, followed by a registered nurse (N=81, 21%) and a chemical dependency counselor (N=81, 21%). When screening for alcohol use problems, some sites also assessed for concurrent psychosocial problems or issues (64%); used evidence-based counseling techniques, such as motivational interviewing (49%); and reported referring patients to specialized alcohol treatment services (71%). A total of 83 (21%) respondents reported that the center had dedicated staff support for conducting

alcohol screening and brief-intervention services.

Eighty-three percent of trauma centers reported routine screening for drugs of abuse (Table 2). For centers that used labs to screen for drugs, blood or serum drug concentration was used by the most centers (N=205, 52%), followed by urine screens (N=160, 41%). All other methods were used by less than 10% of centers. Among centers that used questionnaires to screen for drug use, no single questionnaire was used by more than 10% of centers. When patients screened positive for drugs on a laboratory test or questionnaire, according to respondents, 9% (N=35) of centers did nothing, 36% (N=142) had an informal discussion with patients, and 35% (N=138) conducted a formal consult for the patients. Most respondents (N=245, 63%) said these consults were most often conducted by social workers, followed by chemical dependency counselors (N=86, 22%), psychiatrists (N=63, 16%), nurses (N=54, 14%), and psychologists (N=42, 11%). Most respondents (N=319, 82%) said that

the same person who was called to consult for alcohol use problems was also called for consultation for drug use problems. Formal consultations for drug use included further psychosocial assessment, according to 56% of respondents, evidence-based counseling techniques (38%), and referral to specialized drug abuse services (59%). A total of 70 (18%) respondents reported that the center had dedicated staff support for conducting drug screening and intervention.

Table 3 presents screening and intervention rates for suicide, depression, and PTSD. A total of 192 (49%) respondents reported that the trauma center screened for suicide. No single questionnaire was consistently reported as the instrument used for suicide screening. In the event that an intervention consult was called for a suicidal patient, the consult was performed by a psychiatrist, according to 190 (49%) respondents, social worker (N=104, 27%), or psychologist (N=86, 22%); all other types of staff member were reported by less than 10% of respondents. Twenty-eight percent (N=111) of respondents reported that the same person who did the consult for alcohol use problems also did the consult for suicide, and 47% (N=183) reported that the person who did the consult for suicide also consulted for PTSD and depression.

Twenty-three percent (N=91) of trauma centers screened for depression. No single questionnaire was consistently reported as the instrument used for depression screening. In the event that a consult was called for a depressed patient, the consult was the responsibility of a psychiatrist, according to 151 (39%) respondents, a social worker (N=100, 26%), or a psychologist (N=83, 21%); all other types of staff member were reported by less than 10% of respondents. A total of 94 (24%) respondents reported that the person who performed a consult for alcohol use problems also did the consult for depression, and 165 (42%) reported that the person who performed the consult for depression also did the consult for comorbid problems, such as PTSD.

Only 7% (N=29) of trauma centers screened for PTSD. In the event that a consult was called for a patient with

Table 2

Screening and use of formal consults for alcohol and drug use problems at 172 level I and 219 level II trauma centers

Variable	Alcohol use							Drug use						
	Total		Level I		Level II		p	Total		Level I		Level II		p
	N	%	N	%	N	%		N	%	N	%	N	%	
Routine screening														
Labs	314	80	128	74	186	85	<.05	297	76	119	69	178	81	<.05
Questionnaire	265	68	132	77	133	61	<.05	125	32	60	35	65	30	.27
Lab or questionnaire	367	94	158	92	209	95	.14	325	83	137	80	188	86	.10
Patients screened at each trauma center														
Labs							.87							.37
Median %	62.5		62		65			60		60		60		
Interquartile range	46		50		45			58		50		65		
Questionnaire							.08							.33
Median %	80		75		90			75		80		74		
Interquartile range	50		67		50			79		69		97		
Received intervention							.44							.21
Median %	90		90		88			90		90		75		
Interquartile range	50		40		50			71		40		80		
Element of formal consult														
Further psychosocial assessment	250	64	118	69	132	60	.09	220	56	99	58	121	55	.65
Evidence-based bedside counseling ^a	190	49	110	64	80	37	<.05	147	38	81	47	66	30	<.05
Treatment referral	279	71	126	73	153	70	.46	231	59	111	65	120	55	.05
Any intervention	326	83	155	90	171	78	<.05	280	72	127	74	153	70	.39

^a Includes motivational interviewing

PTSD, the consult was performed by a social worker, according to 97 (25%) respondents, a psychiatrist (N=94, 24%), or a psychologist (N=58, 15%); all other types of staff member were reported by less than 10% of respondents.

After adjustments for organizational characteristics, the multivariate logistic regression analyses indicated that level I trauma centers were significantly more likely than level II centers to use questionnaire-based screening procedures and to have an intervention available for alcohol use problems. Level I centers were also significantly more likely to have evidence-based bedside counseling available for alcohol and drug use problems. Level I centers were significantly more likely to provide bedside counseling and evidence-based therapy for PTSD. In contrast, 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, millions of Americans 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 ACS to provide the highest-quality injury care (22). The ACS 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 patients who screen positive.

Table 3

Screening and use of formal consults for suicide, depression, and PTSD at 172 level I and 219 level II trauma centers

Variable	Suicide			Depression			PTSD		
	N	%	p	N	%	p	N	%	p
Routine screening			<.05			<.05			.77
Level I	74	43		31	18		12	7	
Level II	118	54		60	27		17	8	
Patients screened at each center			.56			.79			.22
Level I									
Median %	100			92.5			60		
Interquartile range	40			80			55		
Level II									
Median %	100			95			50		
Interquartile range	10			50			85		
Patients received formal consult			.97			.37			.10
Medication									
Level I	101	59		92	54		63	37	
Level II	129	59		127	58		63	29	
Bedside counseling			.44			.70			<.05
Level I	97	56		89	52		75	44	
Level II	132	60		109	50		73	33	
Evidence-based therapy			.65			.59			<.05
Level I	73	42		61	36		49	29	
Level II	98	45		72	33		40	18	
Any intervention			.07			.41			.5
Level I	112	65		107	62		90	52	
Level II	161	74		145	66		107	49	

A literature review suggested that this is the first investigation to assess the impact of the mandate on screening and intervention practices at level I and II trauma centers in the United States. The results of this survey, which included responses from 75% of trauma centers, indicate that the mandate appears to have influenced the care that injured patients receive for alcohol use problems. Prior to the mandate, 79% of trauma centers reported screening patients for alcohol use problems through either a laboratory test or questionnaire (23). Now, over 90% of level I and II trauma centers screen patients for alcohol use problems through either a laboratory test or questionnaire. Nearly 65% of level I trauma centers conduct some sort of evidence-based intervention, compared with a rate of 41% prior to the mandate's 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 appeared to screen for drugs more frequently 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 provide interventions for patients who screen positive for drugs than for patients with alcohol problems.

The investigation documented markedly lower frequencies of systematic screening and intervention procedures for suicidality, depression, and PTSD than for substance use disorders. Of particular note, only 7% of level I and II trauma centers routinely screen for PTSD. Previous studies have demonstrated the effectiveness of PTSD screening and intervention at trauma centers (25,29). By adopting population-

based, automated screening procedures for PTSD, trauma centers could make screening for PTSD more efficient, making it possible to reach more people and to have a greater overall impact on the population (30–32). These methods could be honed to enhance screening rates for the full spectrum of comorbid mental illnesses, including depression. Finally, the decision by the ACS to mandate screening and intervention procedures offers a modicum of stability in an otherwise markedly fluctuating U.S. health care system.

This investigation had limitations. Trauma program coordinators were contacted to complete the questionnaire because they were believed to have a comprehensive knowledge of their trauma centers' screening and intervention practices. It could be that at some sites, other individuals were more knowledgeable about use of screening and intervention procedures for mental and substance use disorders. Also, although the screening and intervention practices described in this article may be temporally associated with policy recommendations by the ACS, the study cannot rule out the possibility that multiple other factors contributed to changes in trauma center screening and intervention practices that occurred since implementation of the mandate.

Conclusions

Integration of treatment for comorbid mental health and substance use problems at U.S. trauma care systems has advanced considerably over the past decade. The ACS has influenced the movement toward integration with mandates for alcohol screening and brief intervention. The results of this investigation documented that alcohol screening and intervention occur frequently at U.S. trauma centers, apparently in response to ACS policy mandates. In the future, efforts to orchestrate clinical investigation and policy could enhance screening and intervention procedures for highly prevalent, comorbid disorders, such as PTSD, depression, and suicidality.

Acknowledgments and disclosures

This work was supported by grants R01 AA016102-01 from the National Institute on Alcohol Abuse and Alcoholism and K24MH08614-

01 from the National Institute of Mental Health. The authors thank Joan Russo, Ph.D., and Jin Wang, Ph.D., for assisting in the data analyses and Leisze Lapping-Carr, B.A., for assisting in the coordination of the survey.

The authors report no competing interests.

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First-Person Accounts Invited for Column

Patients, family members, and mental health professionals are invited to submit first-person accounts of experiences with mental illness and treatment for the Personal Accounts column in *Psychiatric Services*. Maximum length is 1,600 words.

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