

Evidenced-Based Time-Limited Treatment of Co-occurring Substance-Use Disorders and Civilian-Related Posttraumatic Stress Disorder

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Substance use disorders (SUDs) and posttraumatic stress disorder (PTSD) frequently co-occur, and this comorbidity results in a more severe clinical presentation and treatment outcome. Consensus is lacking regarding best practices; however, a number of integrated psychosocial treatments (e.g., Seeking Safety, Substance-Dependence PTSD Therapy, Concurrent Treatment of PTSD and Cocaine Dependence) have shown empirically supported promise in reducing symptoms of both disorders. Very little research has been conducted to date on pharmacological treatments for this dual diagnosis or on assessments. This article reviews the developing literature in this area and discusses future directions for research. [*Brief Treatment and Crisis Intervention* 6:283–294 (2006)]

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The high comorbidity of substance use disorders (SUDs) and posttraumatic stress disorder (PTSD) has been widely reported. The most recent U.S. epidemiological study is the National Comorbidity Survey Replication (Kessler et al., 2005), which assessed a nationally representative sample of over 9,000 adults. The lifetime prevalence rate of PTSD was 6.8%, and for

any SUD was 14.6% (Kessler et al., 2005). In the first National Comorbidity Study, adults with PTSD versus those without were two to four times more likely to have an SUD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

These numbers are consistent with epidemiological evidence from the Australian National Survey of Mental Health and Well-Being, a survey with a stratified sample of over 10,000 (Mills, Teesson, Ross, & Peters, 2006). In this sample, 34.4% of respondents with PTSD also had at least one SUD. Alcohol-use disorders were the most common, with a 5.19 times (adjusted for age and sex) increased likelihood of an alcohol use disorder among those with PTSD.

The explanation for the comorbidity of PTSD and SUDs has not been fully elucidated. Breslau

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(2002), in her review of the epidemiological evidence, noted that the most likely explanations for comorbidity are a shared vulnerability, shared external cause to both types of disorders, or PTSD as a cause of comorbid SUDs. Breslau also noted that there is some evidence of a shared genetic link for PTSD and substance dependence (cf. Xian et al., 2000).

Our limited understanding of the etiology of PTSD/SUD comorbidity has likely affected the development of effective treatments. The present paper reviews the developing literature on assessment and treatment of civilian-related PTSD and comorbid SUDs. Psychosocial and pharmacological treatments are covered, along with future directions for research.

Psychosocial Treatments

Consensus is lacking regarding the best approach to treat comorbid PTSD and SUDs. Most individuals who have both disorders receive SUD treatment only (Najavits et al., 2004; Young, Rosen, & Finney, 2005). For those clients who do receive treatment for both the SUD and PTSD, most receive a sequential form of therapy. That is, they first receive SUD treatment, with trauma/PTSD-related issues being deferred. Subsequent to the completion of SUD treatment, clients are referred for PTSD treatment that is often provided by a different clinician at a separate clinic or treatment center. Proponents of the sequential treatment model state that continued substance use during therapy will impede therapeutic efforts and/or that the PTSD treatment may be too stressful for clients and may induce relapse (Nace, 1988; Pitman et al., 1991). However, neither are there little empirical data to support these concerns nor are there any empirical data supporting the efficacy of the sequential model singularly or in comparison to other treatment models. Furthermore, the studies that have been con-

ducted to date (and which are described in greater detail in this paper) that have examined the tolerability and efficacy of addressing trauma/PTSD issues among SUD patients have shown that substance use typically decreases significantly and does not increase with the addition of trauma-focused interventions (Brady, Dansky, Back, Foa, & Carroll, 2001; Najavits, Schmitz, Gotthardt, & Weiss, 2005; Triffleman, 2000).

Another approach to treating comorbid PTSD and SUDs is the integrated model, during which both disorders are simultaneously targeted in therapy, typically by the same clinician. Proponents of this model indicate that the trauma/PTSD symptoms strongly influence the substance use and that in order to fully treat the SUD, the contributing PTSD symptoms must also be targeted. In addition, untreated PTSD symptoms may impede SUD treatment in that some clients will relapse because of these untreated symptoms. Insofar as substance abuse represents self-medication of PTSD symptoms (Khantzian, 1985), addressing the trauma first, or early in treatment, and providing some concurrent relief from PTSD symptoms may improve the chances of recovery from substance abuse (Brown et al., 1995; Ouimette et al., 1997).

Compelling evidence is also provided by a recent study that investigated the temporal course of improvement in PTSD and alcohol-dependence symptoms among 94 individuals participating in 12-week outpatient trial (Back, Brady, Sonne, & Verduin, in press). Study completion rates were significantly higher for individuals who demonstrated improvement in both disorders. Furthermore, improvements in PTSD had a greater impact on improvement in alcohol-dependence symptoms than the reciprocal relationship. Several other smaller studies have also observed this relationship (Back, Brady, Jaanimägi, & Jackson, 2006; Brown, Stout, & Gannon-Rowley 1998; cf. Read, Brown, & Kahler, 2004).

Although preliminary, these findings suggest that co-occurring PTSD symptoms have a strong impact on SUD treatment outcome and that integrated forms of treatment may be important in optimizing outcomes for patients with comorbid PTSD and substance dependence. Finally, a large percentage of PTSD/SUD clients indicate that they would prefer to receive integrated treatment delivered by the same clinician (Back et al., 2006; Brown et al., 1998; Najavits et al., 2004). Several integrated treatments, described briefly in this paper, have been developed, and the preliminary results are promising.

Seeking Safety

Najavits (1998, 2002) developed a 25-session, integrated, manualized treatment called Seeking Safety (SS). In contrast to other integrated PTSD/SUD treatments that focus on processing traumatic events that occurred in the past, SS focuses on the present and does not require clients to relive or process the trauma, although it may be combined with trauma-processing integrated models if appropriate (Najavits, 2004). SS is designed to bolster stabilization and safety by (a) providing psychoeducation, (b) teaching coping skills, and (c) helping clients gain more control over their lives. Sample session topics, articles, training, and information about assessment materials can be found at <http://www.seekingsafety.org>.

Of the few integrated psychosocial treatments designed for PTSD/SUD clients, SS has received the most empirical investigation. SS was first developed for adult women in a group modality but has since been expanded for men, adolescents, and individual therapy. The first study was an uncontrolled pilot study (Najavits, Weiss, Shaw, & Muenz, 1998) of 27 women with PTSD and various types of addiction. The treatment was delivered in a group format. Najavits found that among the 17 women who completed

the treatment (defined a priori as attending at least 25% of the sessions), significant improvements were seen in substance use (as measured by the Addiction Severity Index [ASI] Drug Use Composite score and abstinence rates), trauma/PTSD symptoms (as measured by the Trauma Symptom Checklist—40 Total Score), interpersonal functioning (as measured by the Social Adjustment Scale), and depressive symptoms (as measured by the Trauma Symptom Checklist—40 Total Score, Brief Symptom Inventory, and Suicidal Behaviors Questionnaire).

In a second study, Zlotnick, Najavits, Rohsenow, and Johnson (2003) explored the use of SS as an adjunct to treatment as usual (TAU) among 18 incarcerated, substance-dependent women. Treatment consisted of twice weekly group sessions for 12 weeks. At the end of treatment, participants demonstrated significant improvement in PTSD symptoms and 53% no longer met criteria for PTSD. At 3-months follow-up, 65% of the women reported having been abstinent from substances within the 3 months of release.

In the first randomized controlled trial of SS, Hien, Cohen, Miele, Litt, and Capstick (2004) compared SS to the “gold standard” substance-abuse treatment, Relapse Prevention, and TAU among 107 urban, low-income women using an individual format. Treatments were conducted twice weekly for 12 consecutive weeks. At the end of treatment, clients in both SS and Relapse Prevention demonstrated significant improvements in substance use, PTSD, and psychiatric symptom severity (Hien et al., 2004). In contrast, clients who received TAU failed to demonstrate significant improvement or, in the case of PTSD symptoms, worsened over time. Even for those in the SS treatments, many of the improvements in PTSD and SUD, however, were not sustained during 6- and 9-month follow-up.

Modifications of SS have also been explored. Among a small sample of five men, Najavits

explored the use of a 30-session combination of SS and a modified version of the exposure therapy of Foa and Rothbaum (1998), called Seeking Safety Plus Exposure Therapy—Revised (Najavits et al., 2005). Preliminary results showed significant improvement in multiple areas of functioning (e.g., substance use, PTSD symptoms, family/social). As yet, there has been no comparison of SS to the revised SS therapy that includes exposure therapy. Finally, Holdcraft and Comtois (2002) employed SS in a community clinic with 20 women diagnosed with a major mental illness (e.g., bipolar, schizophrenia), not necessarily PTSD or an SUD. These findings also revealed significant improvements in multiple arenas of functioning.

Exposure-Based Therapy in Comorbid SUD/PTSD Populations

Prolonged Exposure (PE) therapy has been shown to be highly effective for PTSD (Foa & Rothbaum, 1998) and has been chosen as the most appropriate form of psychotherapy to manage PTSD by the International Consensus group on Depression and Anxiety (Ballenger et al., 2000). Despite the evidence documenting its efficacy, PE is underutilized as a treatment for PTSD/SUD patients (Becker, Zayfert, & Anderson, 2004). Some of the reasons for this include the concern that PE may induce relapse or clinical deterioration, therapists' lack of training and comfort with PE, theoretical orientation, or other perceived contraindications for the use of PE among SUD patients (Becker et al., 2004; Nace, 1988; Pitman et al., 1991; Triffleman, Carroll & Kellogg, 1999).

With some notable exceptions, the clinical application and empirical investigation of exposure-based therapies has been limited to individuals without comorbid SUDs. Rather than reject the use of exposure and its potential long-term benefits, however, researchers have begun to consider how PTSD/SUD clients could

be safely and effectively treated with exposure-based techniques. The challenge of developing a treatment for clients with PTSD/SUD centers on the dual task of shoring up skills to initiate and maintain abstinence from substances while also using effective trauma-related techniques that will promote rather than interfere with recovery from substances. Coffey, Dansky, and Brady (2003) and Coffey, Schumacher, Brimo, and Brady (2005) provide a detailed discussion of ideal candidates and caveats to consider when implementing exposure therapy with this dually diagnosed population. In addition, Riggs, Rukstalis, Volpicelli, Kalmanson, and Foa (2004) address potential pitfalls to PTSD/SUD treatment and ways to enhance retention.

Substance-Dependence PTSD Therapy

To date, two studies have been conducted that systematically examine an intervention that integrates exposure-based techniques for PTSD with an empirically validated treatment for SUD. Triffleman and colleagues pioneered the effort to apply exposure to SUD samples through the use of an integrated cognitive-behavioral therapy, Substance-Dependence Posttraumatic Stress Disorder Therapy (SDPT; Triffleman, 2000; Triffleman et al., 1999). SDPT is a 20-week, twice weekly, two-phase manualized outpatient treatment that also utilizes relapse prevention, coping skills, psychoeducation, and in vivo exposure for individuals with civilian-related PTSD. In a small controlled pilot trial ($N = 19$) using methadone-maintained primary cocaine-abusing subjects, SDPT was contrasted to Twelve-Step Facilitation Therapy. Improvements were observed in PTSD symptom severity and number of PTSD symptoms, ASI drug composite scores, and number of days using substances in the past 30 days. However, there were no significant differences in outcomes between treatment conditions, a finding that may be due to the small sample size and the

short follow-up period of 1 month. Also of relevance, SDPT did not incorporate imaginal exposure, only in vivo exposure.

Concurrent Treatment of PTSD and Cocaine Dependence

In a larger Stage IA investigation, Brady and colleagues (Back, Dansky, Carroll, Foa, & Brady, 2001; Brady et al., 2001; Coffey et al., 2005) developed a manualized treatment consisting of combined imaginal and in vivo exposure therapy for PTSD and cognitive-behavioral relapse prevention techniques for individuals with comorbid PTSD and cocaine dependence. The treatment protocol, known as Concurrent Treatment of PTSD and Cocaine Dependence (CTPCD) was adapted from Edna Foa's PE work and previous work in the area of cognitive-behavioral therapy for SUDs (Carroll, 1998; Project MATCH Research Group, 1997) and includes 16 individual 90-min psychotherapy sessions delivered one to two times per week. Approximately six to nine sessions include imaginal exposure. Results of a preliminary study ($N = 39$) showed that treatment completers (defined a priori as those who attended at least 10 sessions and who received at least three exposure therapy sessions) demonstrated significant pre- to posttreatment reductions in all three clusters of PTSD symptoms as measured by the Clinician-Administered PTSD Scale and improvements based on self-report forms (i.e., Impact of Events Scale, Mississippi Scale for PTSD; Brady et al., 2001). Significant reductions in cocaine use, as measured by the ASI, were observed. Approximately 10% of urine drug screen tests were positive each week, and this rate did not increase during treatment. Symptoms of depression, as measured by the Beck Depression Inventory, and psychiatric distress, as measured by the ASI, showed significant improvement, as well. Furthermore, improvements in PTSD symptoms

and cocaine use were maintained over a 6-month follow-up period.

One study explored a modified version of CTPCD. In order to use CTPCD among inner-city clients at a CMHC, Coffey et al. (2005) created CMHC-CTPCD, which used both individual and group therapy format; consisted of a team-based treatment approach including the individual therapist, the group therapist, case managers, and a psychiatrist; and added a dialectical behavior therapy psychosocial skills-training group. Preliminary clinical observations indicate that CMHC-CTPCD also leads to reduced trauma-related symptoms, improves SUD outcomes, and is well tolerated (Coffey et al., 2005).

The findings from these preliminary investigations provide evidence that imaginal and in vivo exposure therapy can be used safely and effectively with this comorbid population. Moreover, concerns about safety whereby exposure therapy would exacerbate substance use have not been borne out. In these studies, exposure did not worsen patients' symptoms, and in fact, it significantly improved PTSD, substance use, and general psychiatric symptoms among treatment completers.

Pharmacological Treatments

Two recent reviews examined the state of the literature for the pharmacological treatment of SUDs and comorbid conditions (Brady & Verduin, 2005; Lingford-Hughes, Welch, & Nutt, 2004). Both reported the existence of very few trials of medications to treat comorbid PTSD and SUDs. Although selective serotonin reuptake inhibitors are the pharmacological treatments of choice for PTSD, only three published studies have examined their use among patients with SUDs; all these studies tested sertraline. The first was a small ($N = 9$) open-label trial with adults with civilian PTSD and

comorbid alcohol dependence (Brady, Sonne, & Roberts, 1995). Patients reported decreases in average number of drinking days and average number of drinks per day. Approximately 50% (four out of nine) reported abstinence through the 12-week follow-up. Significant reductions in all three PTSD symptom clusters were also observed.

A second sertraline study was conducted as an extension of the first. Ninety-four adults with alcohol dependence and PTSD received either sertraline or placebo for 12 weeks (Brady et al., 2005). In general, the sertraline and placebo groups did not differ on drinking variables. There were statistical trends for the sertraline group to show less severe PTSD symptoms, particularly in intrusion and hyperarousal symptoms. Follow-up cluster analyses identified that the medication-responsive group tended to have a PTSD diagnosis that preceded their alcohol-dependence diagnosis. This finding suggests that relieving PTSD symptoms may, in turn, relieve the need for self-medication and thereby reduce alcohol consumption (Brady et al., 2005). More detailed examinations of comorbidity subtypes are needed to confirm this possibility.

A secondary analysis of the Brady et al. (2005) data examined the use of sertraline among patients with either comorbid depression or anxiety and PTSD plus alcohol dependence (Labbate, Sonne, Randal, Anton, & Brady, 2004). The results indicated that having a second anxiety disorder or depression did not detract from treatment response to sertraline. There was moderate improvement in interviewer-rated PTSD scores and considerable reduction in self-reported drinking.

One unique study combined case management, motivational enhancement treatment for alcohol use disorders, and pharmacological treatment for the prevention of PTSD (Zatzick et al., 2004). This intervention, termed "collaborative care," was compared to TAU among

a sample of injured surgical inpatients. The results were somewhat mixed but encouraging. Patients who evidenced some symptoms of PTSD were provided with "evidence-based" medication, and their symptoms did not worsen over the study period, in contrast to patients in the TAU condition, whose symptoms worsened. Unfortunately, the study does not allow for a clear understanding of the role of medication in outcomes, in part because the specific medications used were not reported and the timing of medications did not coincide with the development of full-blown PTSD. Although the authors noted the high rate of spontaneous recovery typically found in PTSD cases, they administered medications at times before the 1-month duration in symptoms that is a diagnostic criterion for PTSD (Zatzick et al., 2004). The results for alcohol use disorders were promising but may be attributable to the cognitive-behavioral intervention rather than pharmacological intervention.

Although pharmacological treatments for PTSD have been relatively well investigated, the evidence for treatment with comorbid SUDs is severely limited. Exploration of medications that have been successfully used to treat PTSD would be a good place to continue this line of work, along with examination of treatment subgroups that may explain differential responding.

Assessment

There are a large number of assessments designed to collect information on either PTSD or SUDs. There is no standard battery of tests for assessing them as comorbid conditions or for assessing their relationship to one another. In general, it is recommended that assessments for PTSD be conducted after an individual has emerged from acute withdrawal (Read, Bollinger, & Sharkansky, 2003). This approach eliminates the potentially confounding effects

TABLE 1. Selected Assessments for PTSD and SUDs

	Format	Number of items
PTSD		
Posttraumatic Diagnostic Scale (Foa et al., 1997)	Self-report	17 symptom, 9 functional impairment
PTSD Checklist (Blanchard et al., 1996)	Self-report	17
Davidson Trauma Scale (Davidson et al., 1997)	Self-report	17
SUDs		
Alcohol Use Disorders Identification Test (Saunders et al., 1993)	Self-report	10
Michigan Alcohol Screening Test (Selzer, 1971)	Self-report or interview	22
Michigan Assessment Screening Test/Alcohol-Drug (Westermeyer et al., 2004)	Self-report	25
Drug Abuse Screening Test (Skinner, 1982)	Self-report or interview	20

SUD = substance-use disorder; PTSD = posttraumatic stress disorder.

of drug intoxication or withdrawal on PTSD symptoms, and patients are likely to be better historians after withdrawal syndromes have passed.

A thorough PTSD assessment begins with the Criterion A from the *Diagnostic and statistical manual of mental disorders—fourth edition (DSM-IV; American Psychiatric Association, 1994)* diagnosis. Criterion A1 requires experiencing, witnessing, or being “confronted with” an event that involved actual or threatened death, serious injury, or a threat to the physical integrity of oneself or others. Criterion A2 requires a response of intense fear, helplessness, or horror. There are a number of self-report and interviewer-administered measures for assessing characteristics of traumatic events, including age at trauma, perpetrator, and frequency of trauma. The reader is referred to other sources for these measures (e.g., Norris & Hamblen, 2004).

After assessing an individual’s exposure to traumatic events, symptoms of PTSD may be assessed. As with measures of trauma exposure, there are many available self-report and interviewer-administered PTSD assessments. A recent review indicated that brief measures

(30 items or fewer) appear to be at least as good as longer, more complicated measures (Brewin, 2005). A select set of these brief measures is described in Table 1.

The Posttraumatic Diagnostic Scale (Foa, Cashman, Jaycox, & Perry, 1997), PTSD Checklist (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), and Davidson Trauma Scale (Davidson et al., 1997) all closely follow *DSM-IV* criteria. A strength of the Posttraumatic Diagnostic Scale is that it may be scored as a continuous measure or a diagnostic scale. The PTSD Checklist may be used to assess reactions to past stressful events. The Davidson Trauma Scale instructs respondents to rate each symptom on frequency and severity, and in recent years, norms have been developed (Davidson, Tharwani, & Connor, 2002). For information on these and other PTSD assessment tools, the reader may consult the National Center for PTSD, which maintains an extensive database of available PTSD measures, references, and ordering information at <http://www.ncptsd.va.gov>.

The availability of brief assessments for SUDs is sparse. One of the most commonly cited is the Alcohol Use Disorders Identification Test (Saunders, Aasland, Amundsen, & Grant,

1993). The Michigan Alcohol Screening Test (Selzer, 1971) has demonstrated adequate psychometric properties as a screening tool. There is also some evidence in support of a modified version of the Michigan Alcohol Screening Test, the Michigan Assessment Screening Test/Alcohol-Drug, as a measure of alcohol and drug use severity (Westermeyer, Yargic, & Thuras, 2004). The Drug Abuse Screening Test has yes/no items with good internal consistency (Skinner, 1982).

Brief screening tools for PTSD and SUDs, when combined, can provide direction for further assessment and follow-up on symptoms. Although there is not a well-established protocol that is recommended for assessment of PTSD/SUD comorbidity, the brevity and sound psychometrics of the measures described above lend themselves to use in a variety of settings. Most do not require extensive training, further extending their accessibility.

Practical Treatment Implications

Given the high co-occurrence of PTSD and SUDs and the negative sequelae associated with this comorbidity, clinicians should (a) routinely screen for trauma and PTSD among SUD patients and (b) provide or refer patients to integrated treatment. In addition, whenever possible, clinicians should (a) address practical barriers to treatment, such as lack of transportation or child care; (b) address limited family and/or social support; (c) employ strategies to enhance retention, such as telephone contact between sessions; (d) provide case management or vocational counseling options; and (e) continue outpatient care for at least 3 months after SUD treatment (Ouimette, Moos, & Brown, 2003; Riggs et al., 2004).

Coffey et al. (2005) offer some clinical guidelines to consider when deciding whether to employ PE. For example, individuals who have

experienced numerous traumas may be less than ideal candidates for standard exposure-based treatment. Coffey et al. suggest that one approach in this situation is to first target the "index trauma" or the most distressing of all the traumatic events. Sometimes, improvement achieved with the index trauma will generalize to other trauma memories. PE may also be less effective for individuals who lack a vivid or cohesive mental image of the trauma. If the imagery fails to become clearer as exposure treatment progresses, in vivo exposure techniques can be utilized and may be more effective (Coffey et al., 2005).

Clinical guidelines for implementing SS are also available (Najavits, 2004) and include, for example, empowering the client by allowing her to make the choice to participate in an integrated treatment or not (as should be the case regardless of the form of treatment provided) and by allowing the client to explore the treatment by attending a few sessions first without any obligation to continue. For more information, visit <http://www.seekingsafety.org>.

Summary

Research consistently shows that PTSD and SUDs frequently co-occur and are detrimental with regard to functioning and treatment outcome. Preliminary studies provide evidence that time-limited, psychosocial treatments for co-occurring PTSD and SUDs can substantially decrease symptoms of both disorders in a relatively brief period with an exceedingly hard-to-reach population. Although additional research is needed to confirm preliminary results, these early studies show that imaginal and in vivo exposure techniques can be used safely and effectively for some PTSD/SUD patients.

There are many areas that continue to warrant investigation. Clinical guidelines for using exposure-based therapies or other integrated

treatments, such as SS, have not been empirically investigated. No studies have compared sequential treatment to integrated treatment or to parallel forms of treatment (e.g., patient receives treatment for PTSD from one treatment provider and SUD treatment from another treatment provider simultaneously). In addition, no studies have compared integrated treatment to PTSD-only or SUD-only treatment. Although significant improvements in both PTSD and SUD treatments have been seen in these studies described, it will be important to develop ways to help maintain these treatment gains. Thus far, studies have included only women or men, or the sample size has been so small that it precluded any gender comparisons. Thus, many questions regarding the effect of gender on treatment outcome remain.

Finally, the addition of pharmacological agents, that might enhance cognitive learning and promote more rapid fear extinction during exposure therapy could be of considerable clinical benefit. Preliminary animal data (Walker, Ressler, Lu, & Davis, 2002) and two small-scale clinical studies examining the use of D-cycloserine to enhance fear extinction among individuals with agoraphobia or social anxiety disorder show promise (Hofmann et al., 2006; Ressler et al., 2004).

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References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Back, S. E., Brady, K. T., Jaanimägi, U., & Jackson, J. (2006). Cocaine dependence and PTSD: Symptom interplay and treatment preferences. *Addictive Behaviors, 31*, 351–354.
- Back, S. E., Brady, K. T., Sonne, S. C., & Verduin, M. L. (in press). Symptom improvement in co-occurring PTSD and alcohol dependence. *Journal of Nervous and Mental Disease*.
- Back, S. E., Dansky, B. S., Carroll, K. M., Foa, E. B., & Brady, K. T. (2001). Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: Description of procedures. *Journal of Substance Abuse Treatment, 21*, 35–45.
- Ballenger, J. C., Davidson, J. R., Lecrubier, Y., Nutt, D. J., Foa, E. B., Kessler, R. C., et al. (2004). Consensus statement update on posttraumatic stress disorder from the international consensus group on depression and anxiety. *Journal Clinical Psychiatry, 65*(Suppl. 1), 55–62.
- Becker, C. B., Zayfert, C., & Anderson, E. (2004). A survey of psychologists' attitudes towards and utilization of exposure therapy for PTSD. *Behaviour Research and Therapy, 42*, 277–292.
- Blake, D., Weather, F., Nagy, L., Kaloupek, D., Klauminzer, G., Charney, D., et al. (2000). *Clinician-administered PTSD scale (CAPS)*. Boston, MA: National Center for Posttraumatic Stress Disorder.
- Blanchard, E. B., Jones-Alexander, J., Buckley, T. C., & Forneris, C. A. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behaviour Research and Therapy, 34*, 669–673.
- Brady, K. T., Dansky, B. S., Back, S. E., Foa, E. B., & Carroll, K. M. (2001). Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: Preliminary findings. *Journal of Substance Abuse Treatment, 21*, 47–54.
- Brady, K. T., Sonne, S., Anton, R. F., Randall, C. L., Back, S. E., & Simpson, K. (2005). Sertraline in the treatment of co-occurring alcohol dependence and posttraumatic stress disorder. *Alcoholism, Clinical and Experimental Research, 29*, 395–401.
- Brady, K. T., Sonne, S. C., & Roberts, J. M. (1995). Sertraline treatment of comorbid posttraumatic stress disorder and alcohol dependence. *Journal of Clinical Psychiatry, 56*, 502–505.
- Brady, K. T., & Verduin, M. L. (2005). Pharmacotherapy of comorbid mood, anxiety, and substance use disorders. *Substance Use & Misuse, 40*, 2021–2041, 2043–2028.

- Breslau, N. (2002). Epidemiologic studies of trauma, posttraumatic stress disorder, and other psychiatric disorders. *Canadian Journal of Psychiatry, 47*, 923–929.
- Brewin, C. R. (2005). Systematic review of screening instruments for adults at risk of PTSD. *Journal of Traumatic Stress, 18*, 53–62.
- Brown, P. J., Recupero, P. R., et al. (1995). PTSD substance abuse comorbidity and treatment utilization. *Addictive Behaviors, 20*, 251–254.
- Brown, P. J., Stout, R. L., & Gannon-Rowley, J. (1998). Substance use disorder-PTSD comorbidity: Patients' perceptions of symptom interplay and treatment issues. *Journal of Substance Abuse Treatment, 15*, 445–448.
- Carroll, K. M. (1998). *A cognitive-behavioral approach: Treating cocaine addiction* (NIH Publication 98-4308). Rockville, MD: National Institute on Drug Abuse.
- Coffey, S. F., Dansky, B. S., & Brady, K. T. (2003). Exposure-based, trauma-focused therapy for comorbid posttraumatic stress disorder-substance use disorder. In P. Ouimette & P. J. Brown (Eds.), *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders* (pp. 127–146). Washington, DC: American Psychological Association.
- Coffey, S. F., Schumacher, J. A., Brimo, M. L., & Brady, K. T. (2005). Exposure therapy for substance abusers with PTSD. *Behavior Modification, 29*, 10–38.
- Davidson, J. R., Book, S. W., Colket, J. T., Tupler, L. A., Roth, S., David, D., et al. (1997). Assessment of a new self-rating scale for post-traumatic stress disorder. *Psychological Medicine, 27*, 153–160.
- Davidson, J. R., Tharwani, H. M., & Connor, K. M. (2002). Davidson Trauma Scale (DTS): Normative scores in the general population and effect sizes in placebo-controlled SSRI trials. *Depression & Anxiety, 15*, 75–78.
- First, M. B., Gibbon, M., Spitzer, R. L., & Williams, J. B. W. (2001). *Structured clinical interview for DSM-IV-TR axis I disorders—research version*. New York: New York State Psychiatric Institute, Biometrics Research Department.
- Foa, E., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: The Posttraumatic Diagnostic Scale. *Psychological Assessment, 9*, 445–451.
- Foa, E. B., & Rothbaum, B. O. (1998). *Treating the trauma of rape: Cognitive-behavioral therapy for PTSD*. New York: The Guilford Press.
- Hien, D. A., Cohen, L. R., Miele, G. M., Litt, L. C., & Capstick, C. (2004). Promising treatments for women with comorbid PTSD and substance use disorders. *American Journal of Psychiatry, 161*, 1426–1432.
- Hofmann, S. G., Meuret, A. E., Smits, J., Simon, N. M., Pollack, M. H., Eisenmenger, K., et al. (2006). Augmentation of exposure therapy with D-cycloserine for social anxiety disorder. *Archives of General Psychiatry, 63*, 298–304.
- Holdcraft, L. C., & Comtois, K. A. (2002). Description of and preliminary data from a woman's dual diagnosis community mental health program. *Canadian Journal of Community Mental Health, 21*, 91–109.
- Jacobsen, L. K., Southwick, S. M., & Kosten, T. R. (2001). Substance use disorders in patients with posttraumatic stress disorder: A review of the literature. *American Journal of Psychiatry, 158*, 1184–1190.
- Kessler, R., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry, 52*, 1048–1060.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*, 593–602.
- Khantzian, E. J. (1985). The self-medication hypothesis of addictive disorders: Focus on heroin and cocaine dependence. *American Journal of Psychiatry, 142*, 1259–1264.
- Labbate, L. A., Sonne, S. C., Randal, C. L., Anton, R. F., & Brady, K. T. (2004). Does comorbid anxiety or depression affect clinical outcomes in patients with post-traumatic stress disorder and alcohol use disorders? *Comprehensive Psychiatry, 45*, 304–310.
- Lingford-Hughes, A. R., Welch, S., & Nutt, D. J. (2004). Evidence-based guidelines for the

- pharmacological management of substance misuse, addiction and comorbidity: Recommendations from the British Association for Psychopharmacology. *Journal of Psychopharmacology*, 18, 293–335.
- Mills, K. L., Teesson, M., Ross, J., & Peters, L. (2006). Trauma, PTSD, and substance use disorders: Findings from the Australian National Survey of Mental Health and Well-Being. *American Journal of Psychiatry*, 163, 652–658.
- Nace, E. P. (1988). Posttraumatic stress disorder and substance abuse. Clinical issues. *Recent Developments in Alcoholism*, 6, 9–26.
- Najavits, L. M. (2002). *Seeking safety: A treatment manual for PTSD and substance abuse*. New York: Guilford Press.
- Najavits, L. M. (2004). Treatment of posttraumatic stress disorder and substance abuse: Clinical guidelines for implementing Seeking Safety therapy. *Alcoholism Treatment Quarterly*, 22, 43–62.
- Najavits, L. M., Schmitz, M., Gotthardt, S., & Weiss, R. D. (2005). Seeking Safety plus exposure therapy: An outcome study on dual diagnosis men. *Journal of Psychoactive Drugs*, 27, 425–435.
- Najavits, L. M., Weiss, R. D., Shaw, S. R., & Muenz, L. (1998). "Seeking safety": Outcome of a new cognitive-behavioral psychotherapy for women with posttraumatic stress disorder and substance dependence. *Journal of Trauma and Stress*, 11, 437–456.
- Norris, F. H., & Hamblen, J. L. (2004). Standardized self-report measures of civilian trauma and PTSD. In J. P. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 63–102). New York: Guilford Press.
- Ouimette, P., C. Ahrens, et al. (1997). Posttraumatic stress disorder in substance abuse patients: Relationships to 1 year posttreatment outcomes. *Psychology of Addictive Behaviors*, 1, 34–47.
- Ouimette, P., Moos, R. H., & Brown, P. J. (2003). Substance use disorder-posttraumatic stress disorder comorbidity: A survey of treatments and proposed practice guidelines. In P. Ouimette & P. J. Brown (Eds.), *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders* (pp. 91–110). Washington, DC: American Psychological Association.
- Pitman, R. K., Altman, B., Greenwald, E., Longpre, R. E., Macklin, M. L., Poire, R. E., et al. (1991). Psychiatric complications during flooding therapy for posttraumatic stress disorder. *Journal of Clinical Psychiatry*, 52, 17–20.
- Project MATCH Research Group. (1997). Matching alcoholism treatments to client heterogeneity. Project MATCH posttreatment drinking outcomes. *Journal of Studies on Alcohol*, 58, 7–29.
- Read, J. P., Bollinger, A. R., & Sharkansky, E. J. (2003). Assessment of comorbid substance use disorder and posttraumatic stress disorder. In P. Ouimette & P. J. Brown (Eds.), *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders* (pp. 111–125). Washington, DC: American Psychological Association.
- Read, J. P., Brown, P. J., & Kahler, C. W. (2004). Substance use and posttraumatic stress disorders: Symptom interplay and effects on outcome. *Addictive Behaviors*, 29, 165–1672.
- Ressler, K. J., Rothbaum, B. O., Tannenbaum, L., Anderson, P., Graap, K., Zimand, E., et al. (2004). Cognitive enhancers as adjuncts to psychotherapy: Use of D-cycloserine in phobic individuals to facilitate extinction of fear. *Archives of General Psychiatry*, 61, 1136–1144.
- Riggs, D. S., Rukstalis, M., Volpicelli, Kalmanson, D., & Foa, E. B. (2003). Demographic and social adjustment characteristics of patients with comorbid posttraumatic stress disorder and alcohol dependence: Potential pitfalls to PTSD treatment. *Addictive Behaviors*, 28, 1717–1730.
- Saunders, J. B., Aasland, O., Amundsen, A., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption—II. *Addiction*, 88, 791–804.
- Selzer, M. L. (1971). The Michigan alcoholism screening test: The quest for a new diagnostic instrument. *American Journal of Psychiatry*, 127, 1653–1658.
- Skinner, H. A. (1982). The drug abuse screening test. *Addictive Behaviors*, 7, 363–371.
- Triffleman, E. (2000). Gender differences in a controlled pilot study of psychosocial

- treatments in substance dependent patients with post-traumatic stress disorder: Design considerations and outcomes. *Alcoholism Treatment Quarterly*, 18, 113–126.
- Triffleman, E., Carroll, K., & Kellogg, S. (1999). Substance dependence posttraumatic stress disorder therapy: An integrated cognitive-behavioral approach. *Journal of Substance Abuse Treatment*, 17, 3–14.
- Ventureyra, V., Yao, S., Cottraux, J., Note, I., & De Mey-Guillard, C. (2002). The validation of the Posttraumatic Stress Disorder Checklist Scale in posttraumatic stress disorder and nonclinical subjects. *Psychotherapy and Psychosomatics*, 71, 47–53.
- Walker, D. L., Ressler, K. J., Lu, K. T., & Davis, M. (2002). Facilitation of conditioned fear extinction by systemic administration of intra-amygdala infusions of D-cycloserine as assessed with fear-potentiated startle in rats. *Journal of Neuroscience*, 22, 2343–2351.
- Westermeyer, J., Yargic, I., & Thuras, P. (2004). Michigan assessment-screening test for alcohol and drugs (MAST/AD): Evaluation in a clinical sample. *American Journal on Addictions*, 13, 151–162.
- Xian, H., Chantarujikapong, S. I., Scherrer, J. F., Eisen, S. A., Lyons, M. J., Goldberg, J., et al. (2000). Genetic and environmental influences on posttraumatic stress disorder, alcohol and drug dependence in twin pairs. *Drug and Alcohol Dependence*, 61, 95–102.
- Young, H. E., Rosen, C. S., & Finney, J. W. (2005). A survey of PTSD screening and referral practices in VA addiction treatment programs. *Journal of Substance Abuse Treatment*, 28, 313–319.
- Zatzick, D., Roy-Byrne, P., Russo, J., Rivara, F., Driesch, R., Wagner, A., et al. (2004). A randomized effectiveness trial of stepped collaborative care for acutely injured trauma survivors. *Archives of General Psychiatry*, 61, 498–506.
- Zlotnick, C., Najavits, L. M., Rohsenow, D. J., & Johnson, D. M. (2003). A cognitive-behavioral treatment for incarcerated women with substance abuse disorder and posttraumatic stress disorder: Findings from a pilot study. *Journal of Substance Abuse Treatment*, 25, 99–105.

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