

Prolonged Exposure With Veterans in a Residential Substance Use Treatment Program

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Prolonged exposure therapy (PE) is effective in reducing posttraumatic stress disorder (PTSD) symptoms among individuals with comorbid substance use disorder (SUD) and PTSD. However, concerns that PE will lead to negative outcomes such as dropout and relapse remain a barrier to high-risk individuals, such as those warranting residential SUD care, receiving PE. The goal of this study was to gather information on feasibility, acceptability, and efficacy of offering PE in residential SUD treatment. Study therapists conducted PE (3 times/week, up to 15 sessions) with 9 patients admitted to a residential SUD treatment program at a Veterans Affairs (VA) hospital. Participants completed the PTSD Symptom Checklist (PCL-S) and Patient Health Questionnaire (PHQ-9) at admission, at discharge from the 4- to 6-week program, and 3-months postdischarge follow-up. Patients who were offered PE tolerated and engaged in PE as indicated by completion of the protocol, high satisfaction scores, and clinically significant decreases in PTSD and depression symptom severity. Symptom reduction at follow-up was significantly greater among patients who received PE than those who did not ($n = 21$). This preliminary data provides initial support for further investigation of the efficacy of PE in residential SUD care.

SUBSTANCE use disorders (SUDs) comorbid with posttraumatic stress disorder (PTSD) are common following trauma exposure. In the general U.S. population, the prevalence of alcohol and substance use disorders is approximately 35% and 29% (respectively) among individuals with PTSD, compared to 24% and 11% (respectively) among those without PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Co-occurring PTSD/SUD is associated with worse treatment outcomes for both disorders, greater risk of suicidality and homelessness, increased disease burden, and greater functional disability than having a single disorder (Calabrese et al., 2011;

Driessen et al., 2008; Edens, Kaspro, Tasi, & Rosenheck, 2011; Possemato, Wade, Anderson, & Ouimette, 2010).

Psychotherapies that include trauma processing have been shown to be among the most effective treatments for PTSD (Institute of Medicine, 2007). Perhaps the most well-studied trauma processing therapy is prolonged exposure (PE; Foa, Hembree, & Rothbaum, 2007). PE requires that patients expose themselves to reminders of the trauma and other avoided stimuli (in-vivo exposure), as well as the trauma memory itself (imaginal exposure). Both in-vivo and imaginal exposures work through the promotion of habituation to distressing stimuli. Over two decades of research studies demonstrate that PE is a highly effective treatment for PTSD and that treatment gains are maintained over time (see meta-analysis by Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010). Exposure to avoided stimuli and memories may sometimes raise distress in the short term, but also allows individuals to habituate to safe environments and learn that they are able to handle these stimuli and memories.

Keywords: prolonged exposure; substance use disorder; PTSD; comorbid; residential treatment

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Although randomized controlled trials of PE have been conducted largely in outpatient settings, PE has been implemented within some intensive PTSD residential treatment settings (e.g., Cook et al., 2013). Cook and colleagues suggest that in order to make PE and other evidence-based treatments for PTSD feasible for residential treatment settings, modifications may be necessary. For example, sessions may need to be conducted more frequently in order to complete therapy in the time a patient is in the residential program. The authors identified barriers to PE in the residential setting, including perceptions by some providers that their patients were too severe or unstable to take part in a trauma processing treatment.

Having an SUD in addition to PTSD can be a barrier to receiving PE (Becker, Zayfert, & Anderson, 2004). Historically, PTSD/SUD has been treated sequentially; SUDs have typically been treated first followed by PTSD treatment after a sustained period of abstinence. Patients with SUDs have not been offered PE or other trauma processing therapies because of beliefs that the ensuing distress would be counterindicated for patients in early SUD recovery (Becker et al., 2004). That is, exposure and trauma processing were thought to exacerbate symptoms and thus increase the risk of relapse (Pitman et al., 1991). Recent studies refute this notion and instead demonstrate that outpatients in early SUD recovery can indeed handle and benefit from exposure therapy (Foa et al., 2013; Mills et al., 2012; Roberts, Roberts, Jones, & Bisson, 2014). Guideline recommendations for treatment of comorbid PTSD and SUD recommend offering best available treatments for both disorders concurrently (VA/DoD Management of Post-Traumatic Stress Working Group, 2010). However, little is known about offering PE or any trauma processing therapy in residential SUD treatment.

Residential treatment is generally considered an appropriate level of care for severe SUD patients. In this setting, patients receive intensive treatment in a structured environment to help with the challenges of early recovery and to develop sufficient skills to safely transition to less intense levels of care (Mee-Lee, Shulman, Fishman, Gastfriend, & Griffith, 2001). It is important to examine PTSD treatment in residential SUD settings because almost 40% of individuals seeking SUD treatment receive care at a residential facility at some point (Substance Abuse and Mental Health Services Administration, 2008). Further, over 25% to 50% of individuals seeking SUD treatment meet current criteria for PTSD (Brady, Back, & Coffey, 2004; Brown, Stout, & Mueller, 1999; Jacobsen, Southwick, & Kosten, 2001).

There are reasons to believe that offering PE in residential SUD treatment may be helpful to long-term recovery. Research indicates that individuals with PTSD relapse more quickly following residential SUD treatment

compared to individuals without PTSD (Brown, Stout, & Mueller, 1996), and PTSD is linked to dropout from residential SUD treatment (Tull, Gratz, Coffey, Weiss, & McDermott, 2013). The relapse and dropout rates are posited to be associated with the intense and frequent emotional distress associated with PTSD (Ouimette, Finney, & Moos, 1999). Further evidence of the need to examine PTSD treatment among severe SUD patients comes from intriguing findings by Fontana, Rosenheck, and Desai (2012), who found that, among veterans in residential PTSD treatment, those with comorbid PTSD and SUD had better PTSD outcomes compared to those with PTSD alone. The authors attributed the differences primarily to improvement in comorbid SUD symptoms, and suggest that there may be a synergistic effect in the treatment of the two disorders. Their findings further refute the notion that the presence of an SUD impedes patients' ability to benefit from PTSD treatment. In fact, they conclude that treating both disorders simultaneously may help patients benefit from treatment for the other disorder as well.

Henslee and Coffey (2010) identified several practical barriers to implementing PTSD treatment into an SUD residential program given the confined structure and limited time on the unit. Suggestions to overcome these barriers include conducting sessions twice weekly in order to complete PE within the length of stay of a residential program, shortening sessions to 60 minutes to fit within the residential treatment schedule, loaning patients audio recorders with headphones to be able to complete assignments in privacy, and using virtual means such as internet resources (e.g., images, sounds) to conduct in-vivo exposures (Henslee & Coffey, 2010).

Berenz, Rowe, Schumacher, Stasiewicz, and Coffey (2012) described the course of treatment for four individuals offered PE in a 6-week community-based residential alcohol use disorder (AUD) treatment. Patients who received PE completed nine 60-minute sessions twice weekly, as well as in-vivo and imaginal exposure homework between sessions. Notably, none of the patients met criteria for PTSD at the end of treatment, and treatment gains were maintained at 3- and 6-months posttreatment. Furthermore, the patients did not relapse in response to undergoing exposure therapy. This small study is significant in that it demonstrates the feasibility and acceptability of incorporating PE in a community residential AUD treatment program.

It is important to also examine PE within SUD residential treatment in Veterans Affairs (VA) medical centers, as VA programs are often shorter (3 to 4 weeks) than the 6-week program described by Berenz et al. (2012), and the hospital setting creates unique challenges to completing exposure assignments. Further, PTSD/SUD comorbidity is highly prevalent among veterans.

Between October 2007 and September 2008, the VA provided treatment to 88,315 veterans with comorbid PTSD and SUD (Petrakis, Rosenheck, & Desai, 2011). Among veterans of the wars in Iraq and Afghanistan, 63% of those diagnosed with a SUD were also diagnosed with comorbid PTSD (Seal et al., 2011).

The goal of this study was to add to the available preliminary information on feasibility, acceptability, and efficacy of offering PE in residential SUD treatment. Specifically, we (a) offered PE to veterans in a VA SUD residential treatment program; (b) conducted our research in a hospital-based rather than community-based treatment program; (c) included participants with a variety of SUDs, not just AUD; and (d) compared PTSD, depression, and treatment satisfaction outcomes from patients with PTSD on the SUD treatment unit who were not offered PE. We also provide case examples of four participants who received PE.

Method

Program Description

The study took place in the Substance Abuse Residential Rehabilitation Treatment Program (SARRTP), a 29-bed residential substance use treatment program with up to 8 beds dedicated to patients with comorbid PTSD. The program is designed to be 28 days; however 7- to 14-day extensions are possible if additional time is needed to help meet treatment goals. Unit programming consists of cognitive-behavioral therapy groups for treating SUD, introducing new skills (e.g., anger management), engaging in experientially based activities (e.g., mindfulness/relaxation), and other recovery-oriented programming (e.g., living skills, job skills). Patients diagnosed with PTSD related to their combat military experiences are offered services on the PTSD track. Patients on the PTSD track receive psychoeducation about PTSD and the interplay of PTSD and SUD, attend a cognitive restructuring group where PTSD-related beliefs are addressed, and take part in an in-vivo group where they practice group exposures to commonly avoided situations (e.g., sitting in a crowded waiting room). The treatment team consists of a clinical psychologist, psychiatrist, addiction therapists, nursing staff, and social workers. Patients on the PTSD track were offered the opportunity to provide informed consent to have their treatment and outcomes on the unit followed for research purposes. Patients who chose to consent to take part in research completed a packet of self-report measures at the start of treatment, prior to discharge, and 3 months later. For the 3 month follow-up assessment, participants were contacted by telephone and scheduled for an in-person assessment. Participants who could not be reached immediately were called two more times, then sent the measures by mail with a stamped, addressed return envelope. Measures were also mailed to partici-

pants who were too far from the VA to return for an in-person appointment. For each set of self-report measures, participants were compensated with a \$10 coupon that could be used at the canteen store or cafeteria of the VA hospital (up to \$30 in coupons).

Participants and Procedure

Thirty patients who enrolled in treatment on the PTSD track of the SARRTP over the course of 1 year completed informed consent and baseline self-report measures. Patients offered PE were identified by the SARRTP psychologist as having PTSD based on chart review and an intake assessment in which symptoms were reviewed and assessed using DSM-IV criteria. Four therapists (advanced psychology trainees) were each available to see one PE case at a time. If a therapist was available at the time a patient was identified, the patient was offered PE in addition to regular SARRTP PTSD-track programming. If no therapist was available, the patient completed treatment as usual (TAU), which consisted of individual and/or group psychoeducation for PTSD based upon a cognitive-behavioral orientation. TAU sessions were intended to introduce patients to evidence-based principles associated with PTSD treatment in order to encourage engagement in trauma-focused treatment upon discharge from SARRTP. Nine patients were offered and completed PE while 21 patients participated in TAU. Note that all patients who were offered PE opted to engage in this treatment option (i.e., no patients declined PE).

Table 1 shows demographic and clinical characteristics. *T*-tests and chi-squares were used to compare PE to TAU on baseline variables showed no group differences (see Table 1), with the exception of number of days on the SARRTP unit; patients receiving PE stayed on the unit a mean of 6.78 days longer than TAU patients (see below; some stays were extended by 1 to 2 weeks in order to complete the PE protocol).

Patients presented with a wide variety of substance use disorders (per chart review; see Table 1). Twelve carried diagnoses of one substance use disorder (83% alcohol only; 8% opioid only; 8% methamphetamines only) while 18 had more than one substance use disorder. Eighteen patients endorsed alcohol as their primary substance of choice, 5 endorsed methamphetamines, 4 endorsed opioids, and 3 endorsed alcohol plus methamphetamines/opioids.

Prolonged Exposure

Patients who received PE completed three 90-minute sessions per week for up to 12 to 15 sessions. Prior to beginning PE, patients attended one pretreatment session with their therapist where the goals were to build rapport, understand the patient's reasons for engaging in trauma-focused treatment, discuss expectations of PE, and

Table 1
Demographic and Clinical Characteristic of Participants at Baseline

	Full Sample (N = 30)	TAU (N = 21)	PE (N = 9)	TAU VS. PE
Baseline Variables				
Age	37.43 (10.64)	36.79 (11.23)	39.67 (10.55)	$p = .53$
Gender: %Male	93.3%	95%	89%	$p = .58$
PCL-S	65.33 (12.17)	65.63 (12.63)	64.22 (12.68)	$p = .79$
PHQ-9	14.96 (7.05)	15.00 (7.61)	15.43 (6.66)	$p = .90$
Days on SARRTP	32.67 (7.29)	31.00 (6.64)	37.78 (6.57)	$p = .02^*$
Satisfaction post treatment	29.25 (3.34)	28.00 (3.81)	30.83 (1.94)	$p = .15$
Substance Use				
<i>(Non-exclusive)</i>				
%Alcohol Use	87%	84%	100%	
%Meth Use	33%	26%	33%	
%Cannabis Use	23%	16%	33%	
%Opioid Use	20%	16%	22%	
%Cocaine Use	17%	16%	22%	
%IV Use (Meth/Opioid)	17%	16%	11%	
%Benzodiazepine Use	7%	11%	0%	
Ethnicity				
Non-Hispanic/Latino	73.3%			
Race				
Caucasian	90%			
African American	3.3%			
Asian	3.3%			
American Indian	3.3%			

Note. PE = Prolonged Exposure; TAU = Treatment as Usual; PCL-S = PTSD checklist, specific; PHQ-9 = Patient Health Questionnaire; SARRTP = Substance Abuse Rehabilitation Residential Therapy Program

discuss potential difficulties that may arise while engaging in PE on a SARRTP. In treatment, patients constructed in-vivo hierarchies based on their avoided stimuli. Patients were assigned to listen to their imaginal exposure recordings between sessions and practice in-vivo exposures daily. In-vivo exposures were designed to start on the unit (e.g., seating placement in groups, back to door in room, not seeing exits, maintaining eye contact, sharing in groups), then progressed to the hospital grounds (e.g., being in the emergency department, riding the elevator, staying in crowded waiting rooms), and eventually to offsite locations (while on day pass) as a way to prepare for integration back into community. In the final session of PE, the therapists talked about relapse prevention in the context of PE symptoms, substance use, and upcoming discharge back to the community. The patient and therapist collaboratively agreed when the patient had adequately completed the protocol. The decision to terminate PE was based upon attainment of established treatment goals, decrease in Subjective Units of Distress (SUDS) scores, decrease in PTSD and depression symptom self-report scores, and consideration of SARRTP discharge date. Average number of PE sessions attended was 10.56 with a range of 8 to 15 sessions. Three patients completed 1 to 3 sessions of PE as outpatients following discharge.

The goal was to provide PE per protocol with as few modifications as possible. For some patients, the therapist would remind the patients to use skills (e.g., dialectical behavior skills, anger management) to help patients complete the sessions and assignments. The therapists helped patients plan the logistics of when and how they would complete homework assignments in some detail given the constraints of the residential unit. In the final session of PE, the therapists talked about relapse prevention in the context of PE symptoms, substance use, and upcoming discharge back to the community. No other deviations from the protocol were noted.

Modifications to other SARRTP programming to facilitate PE consisted of extending the patients' length of stay by 1 to 2 weeks if needed to be able to complete a full course of PE. After a patient completed 28 days of substance use treatment, requirements to attend SARRTP groups were relaxed to allow for more time to engage in components of PE, such as off-site in-vivo exposures. PE therapists communicated frequently with other members of the treatment team so that other providers could support the patient's goals while in PE. Specific in-vivo assignments, change in trauma-related symptoms, and treatment challenges were discussed. The therapists also coordinated with other providers to ensure that PE

sessions occurred at a time that did not overlap with other programming on the unit.

Measures

PTSD Symptoms

Patients reported on their PTSD symptoms in the past month via the 17-item Posttraumatic Stress Disorder Checklist–Specific (PCL-S; Weathers, Litz, Herman, Huska, & Keane, 1993), which maps directly onto DSM-IV diagnostic criteria. Items ranged from 1 (*not at all*) to 5 (*extremely*). The PCL-S showed strong internal consistency (Cronbach alpha = .85).

Depression Symptoms and Suicidality

Participants' self-reported depression symptoms over the past 2 weeks were assessed via the Patient Health Questionnaire-9 (PHQ-9; Kroenke & Spitzer, 2002), a 9-item screening instrument for depression. Items ranged from 0 (*not at all*) to 3 (*nearly every day*). The PHQ-9 showed strong internal consistency (Cronbach alpha = .91).

Treatment Satisfaction

The 8-item Client Satisfaction Questionnaire (CSQ) was used to measure satisfaction with treatment (Attkisson, & Greenfield, 1994). It has excellent internal consistency and correlates with therapists' estimates of client satisfaction. The CSQ showed strong internal consistency (Cronbach alpha = .90).

Demographics

Demographics were collected through self-report and chart review. Race and ethnicity were assessed using the VA guidelines that categorize ethnicity as Hispanic/Spanish/Latino or non-Hispanic/Spanish/Latino and race as White, African American, Native Hawaiian/Pacific Islander, Asian, and American Indian/Alaskan Native.

Results

Attrition

Four participants did not complete posttreatment assessments (4 TAU, 0 PE) and 14 participants did not complete 3-month follow-up assessments (13 TAU, 1 PE). Two participants completed only the baseline question-

naire (both TAU). *T*-tests were conducted to compare participants who completed only the baseline assessment ($n = 2$) and those who completed at least one other assessment (post- and/or follow-up; $n = 28$). No baseline differences in demographics, PTSD symptom severity, depression symptom severity, or number of days on the SARRTP unit were found.

Acceptability of PE

Patients who were offered PE tolerated and engaged in PE as indicated by the completion of the protocol, high satisfaction scores (see Table 1), and significant decreases in PTSD and depression symptom severity (see Table 2). One hundred percent of veterans ($n = 9$) who started PE while on the SARRTP unit completed PE, and 88.9% of veterans were over the clinical cutoff of 50 on the PCL-S at pretreatment. Through treatment the mean PCL-S scores dropped, on average, 25.75 ($SD = 11.04$) points from baseline to follow-up, $t(7) = 6.60$, $p < .001$, where a 10-point change on the PCL-S is considered clinically significant (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). At the end of treatment only 25% of veterans were above the clinical cutoff score on the PCL-S.

Prior to treatment, 71.4% of veterans scored in the moderate to severe range on the PHQ-9. Through treatment, the mean PHQ-9 scores dropped 8.34 ($SD = 4.68$) points from baseline to follow-up, $t(5) = 4.37$, $p = .007$, where a 5-point decrease on the PHQ-9 is considered clinically significant (Kroenke & Spitzer, 2002). At the end of treatment only 25% of veterans were still in the moderate to severe range.

PE Compared to TAU

Means, standard deviations, and *t*-tests of observed scores over time by TAU and PE are shown in Table 2. Data were analyzed using mixed model procedures (Raudenbush & Bryk, 2002), which allowed for maximum available data to be used in the analyses. This approach takes into account all the obtained data and missingness for participants, reducing the analytic problem presented by missing data for intent-to-treat analyses. Main fixed

Table 2
Means, *t*-Test, and Effect Sizes of PCL-S and PHQ-9 Over Time by Treatment Condition

	Baseline				Post Treatment				Follow Up			
	PE	TAU	<i>t</i> -test	<i>r</i>	PE	TAU	<i>t</i> -test	<i>r</i>	PE	TAU	<i>t</i> -test	<i>r</i>
PCL-S	64.22	65.63	0.32	0.06	43.44	56.94	2.10*	0.39	38.63	59.63	2.70*	0.59
(<i>SD</i>)	(12.68)	(12.63)			(19.67)	(13.07)			(16.34)	(14.79)		
PHQ-9	15.42 (6.66)	14.78 (7.38)	-0.20	0.04	11.69 (7.08)	10.14 (7.69)	0.45	0.11	7.38 (6.16)	14.00 (9.42)	1.60	0.42
(<i>SD</i>)												

Note. PE = Prolonged Exposure; TAU = Treatment as Usual; PCL-S = PTSD checklist, specific; PHQ-9 = Patient Health Questionnaire; *** = $p < .001$; ** = $p < .01$; * = $p < .05$

effects were Condition (PE vs. TAU), Time, and the interaction of Condition by Time. Several random factor models using slope and intercept were tested. We found that using a random intercept model with fixed slopes fit the data best as indicated by a significant chi-square difference test of the log-likelihood values, $\chi^2(1, N = 30) = 10.16, p < .001$; all models converged successfully. There was a main effect of Time, $b = -13.44, SE = 2.67, t(42.29) = -5.03, p < .001, 95\% CI(-18.84, -8.04)$, reflecting an average decrease of 13.44 points on the PCL-S at each time point. In addition, the interaction effect of Condition by Time was significant, $b = 9.99, SE = 3.51, t(44.02) = 2.85, p = .007, 95\% CI(2.91, 17.07)$, indicating that the PE group had larger decreases on the PCL-S than the TAU group over time (see Figure 1). Planned comparisons showed that PCL-S scores significantly decreased over time for participants in the PE condition, $b = -13.59, SE = 2.44, t(16.20) = -5.572, p < .001, 95\% CI(-18.76, -8.42)$, but not in the TAU condition, $b = -3.73, SE = 2.38, t(29.35) = -1.57, p = .13, 95\% CI(-8.61, -1.13)$.

We next compared scores on the PHQ-9 between the PE and TAU conditions. Several random factor models using slope and intercept were tested and we found that using a random intercept model fit the data best, as indicated by a significant chi-square difference test comparing the log-likelihood values, $\chi^2(1, N = 30) = 11.64, p < .001$. There was a main effect of Time, $b = -3.92, SE = 1.33, t(33.01) = -2.94, p = .006, 95\% CI(-6.62, -1.21)$, reflecting an average decrease of 4 points on the PHQ-9 at each time point. The interaction effect of Condition by Time was not significant, $b = 3.31, SE = 1.79, t(34.36) = 1.85, p = .07, 95\% CI(-0.33, 6.94)$ (see Figure 2); however, follow-up comparisons showed the PE condition had significant decreases on the PHQ-9 over time, $b = -3.89, SE = 1.05, t(13.93) = -3.70, p = .002, 95\% CI(-6.15, -1.63)$, while the TAU condition did not decrease over time, $b = -0.64, SE = 1.34, t(21.23) = -0.48, p = .64, 95\% CI(-3.44, 2.15)$.

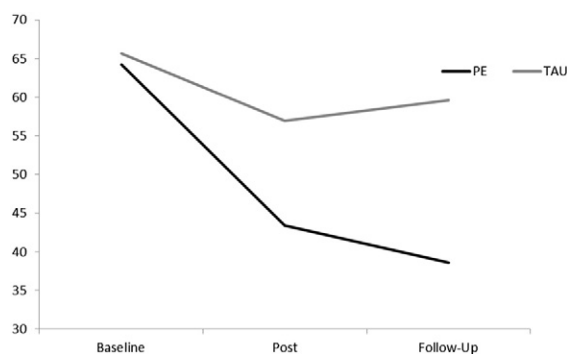


Figure 1. Observed PCL-S scores over time, stratified by group.

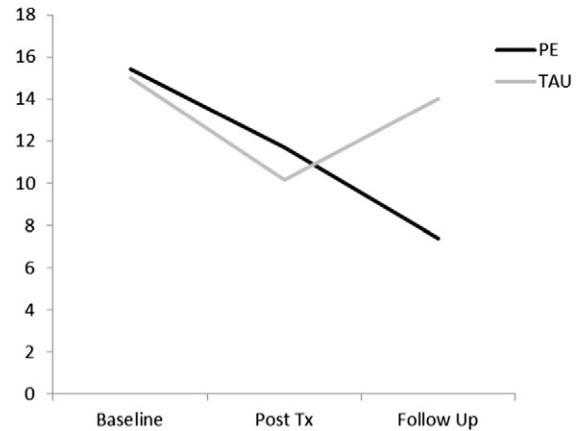


Figure 2. Observed PHQ-9 scores over time, stratified by group.

We also ran repeated measures ANOVA for PCL-S and PHQ-9 including only participants who completed measures at all three time points. Results did not differ from those obtained using mixed model procedures. We ran a t -test comparing treatment satisfaction at posttreatment between PE and TAU (Table 1). Both groups endorsed high treatment satisfaction and satisfaction did not differ by treatment condition.

Clinical Vignettes With Identifying Details Altered (See Figure 3 for Clinical Vignette PCL-S and PHQ-9 Scores)

The four case vignettes presented below were selected in order to illustrate the diversity of trauma types, time since trauma, and addictions profiles of our participants.

Clinical Vignette 1: Female Noncombat Veteran—Adult Sexual Trauma

A noncombat veteran in her fifties reported a chaotic and traumatic childhood, which included abuse by a family member. She was sexually assaulted as a young adult. As a result she experienced physical injury, a traumatic brain injury, and psychological distress. She subsequently became dependent on alcohol and multiple substances. She had previously completed a 28-day residential substance use treatment through the VA and multiple community-based recovery programs. During her previous substance use treatment, she was not offered PTSD treatment. She sought PTSD treatment in the community, completed a few sessions of psychotherapy for PTSD, then dropped out of treatment.

Over a period of 6 weeks, she completed 15 sessions of individual therapy of which 11 sessions were dedicated to PE. Over the course of treatment, she was at times ambivalent about treatment. It was not uncommon for her to experience physiological symptoms (e.g., nausea, headaches, and body pain) after a session. At times, she demonstrated emotional lability and some staff were

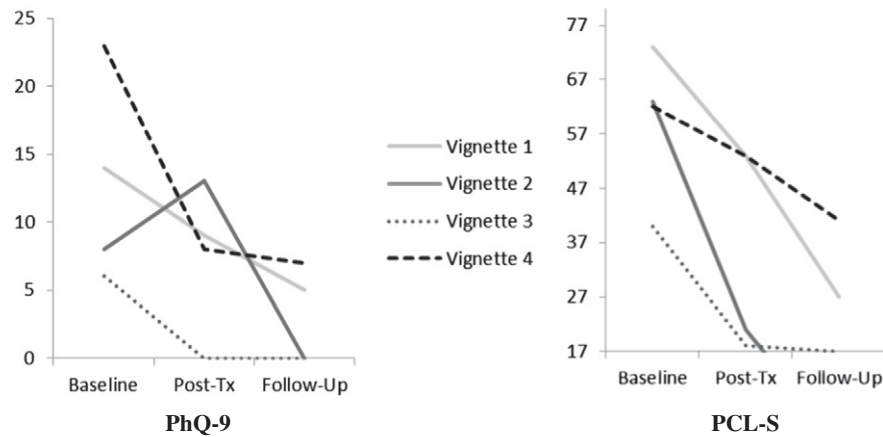


Figure 3. Vignette series of PHQ-9 and PCL-S scores over time.

concerned that PE was negatively affecting her. The therapist helped her use coping skills that she was learning on the unit. In-vivo assignments included making eye contact, spending time in crowded areas of the hospital, and exposing herself to smells that reminded her of her trauma. After her first hotspots session (PE Session 7), she refused to engage in two sessions of imaginal exposures and contemplated discontinuing PE. However, she was able to reengage with the treatment. At Session 10, she reported significant decrease in her own self-blame with the assault. She remained active and engaged throughout the remainder of treatment both with PE and in her SUD treatment. At the end of treatment, she expressed gratitude for the opportunity to go through PE. At 3-month follow-up, she had a volunteer position, was having regular visits with her children, and had remained abstinent.

Clinical Vignette 2: Male Noncombat Veteran With Physical Assault Trauma

A non-combat veteran in his sixties reported a history of childhood physical and emotional abuse. In his early adulthood, he experienced being the victim of a physical assault that was the focus of his PE treatment. He experienced feelings of guilt, shame, remorse, and a negative view of himself. He had a long-standing history of using alcohol and marijuana to cope with negative emotions and intrusive trauma-related thoughts and images. During the year prior to treatment initiation, he had been drinking approximately 750 ml of hard liquor daily. He reported numerous mental health and substance use treatments, which included multiple residential mental health treatment stays, predominantly for suicidal thoughts and/or suicide attempts and multiple residential 28-day substance use treatment stays through the VA system, as well as community-based substance use treatment in various states. Per the veteran's report, he

asked for trauma-focused treatment on multiple occasions, but said he was denied due to his inability to maintain sobriety.

While in SARRTP, he completed 12 sessions of PE in 4 weeks. At the start of treatment, he endorsed feeling "desperate" to treat his PTSD symptoms and remained active, engaged, and compliant with treatment, as evidenced by no missed sessions and the full completion of all homework assignments. Some of the veteran's in-vivo exposures included seating placement within a room, sharing in groups, riding the elevator, seat placement on public transportation, and being in crowded places. He also began engaging in pleasurable activities, such as painting and enjoying time outside. He was surprised by the progress he had made, and acknowledged that this was one of the first times in his life that he "felt good." The veteran moved out of the area and we were not able to make contact with him to collect follow-up data.

Clinical Vignette 3: Male Combat Veteran With Childhood Sexual Trauma

A combat veteran in his forties endorsed a history of childhood physical and sexual abuse. He also experienced several traumatic events during adulthood, including sexual trauma and the loss of several friends during combat. He identified his childhood sexual trauma as contributing to the most distress in his life, and this was the focus of his treatment. He began using methamphetamines in his twenties. He described a cycle in which trauma reminders led to shame and depressed mood and thereby increased his substance use. He reported that his substance use history contributed to psychosocial problems including poor relationships, aggressive behavior, and prison time.

Prior to his most recent admission to SARRTP, he had a previous admissions to 28-day VA SARRTP programs

and numerous non-VA community-based substance use treatments. He did not disclose his trauma history during his previous treatment due to feelings of shame and guilt, and thus had not been assessed for PTSD. Prior to engaging in PE, he described feeling like he was “ready” and “it was time” to engage in trauma-focused treatment. He initially presented as anxious and expressed skepticism regarding PE, but actively engaged in treatment and was compliant with homework assignments. He completed 9 sessions of PE over 4 weeks on SARRTP. In-vivo exercises included standing in bathrooms, sharing more about himself in groups, and sitting next to other men in groups. He actively challenged himself in practicing in-vivo exposures on the unit and within the community, and made significant progress over the course of treatment. At the end of treatment, he described PE as “changing [his] life.” At 3-month follow-up, he was employed, living in a recovery home with other men, spending time with family, and reporting abstinence from substances.

Clinical Vignette 4: Male Combat Veteran With Combat Trauma

A veteran in his twenties who killed an unarmed civilian in combat who he believed to be armed at the time. This event resulted in feelings of guilt and shame, as well as a loss of spirituality. Upon returning to the United States, he began using substances, such as alcohol, cocaine, and methamphetamine. He stated that it took him more than 5 years to obtain the courage to come into treatment. Prior to his admission to SARRTP, he had multiple arrests for driving under the influence, was reclusive, was unable to engage in any social interactions without being under the influence, was not employed, and was using substances daily. Once on the unit, the veteran discussed that without being under the influence of substances, it became apparent how severely PTSD symptoms were negatively affecting his life.

Although he presented as anxious, dysphoric, and skeptical that treatment would work for him, he completed 12 sessions of PE. His in-vivo exposures included making eye contact with others, taking part in pleasurable activities such as watching sports on TV in the common area of SARRTP, calling his family, riding in an elevator, and going to stores. Throughout treatment, he struggled with guilt-related thoughts; however, he described that going through PE helped him to “no longer only look at the end of the story.” He was able to start to accept that he also went through this trauma, and that he was “not 100%” at fault for the outcome of the event. Around Session 8, a shift in cognitions surrounding self-blame occurred. He began to openly challenge himself to process his emotions. For example, he reported that while listening to his imaginal exposure for homework, he would rewind his audio recording to difficult parts,

listening to it multiple times and allowing for extra processing. He was able to remain active and engaged in all aspects of his treatment, sharing his positive experiences with his family and peers. At 3-month follow-up, he was living in a recovery home, looking into going to school, spending time with family, and maintaining abstinence.

Discussion

The goal of this study was to provide feasibility, acceptability, and preliminary efficacy information about PE in residential substance use treatment. This was the first such study with a veteran sample and in a hospital setting. Our findings were consistent with those of [Berenz and colleagues \(2012\)](#) in that patients in residential SUD treatment were able to tolerate and complete PE and, most important, benefit from PE in regard to reductions in PTSD and depression symptoms. Our data suggest that those patients with PTSD/SUD who received PE maintained treatment gains from residential SUD treatment better than those who receive only TAU. Notably, several patients told us that they had previously tried to receive PTSD treatment and had been refused because of their substance use history. Our findings suggest that the structure and support of a residential unit may in fact facilitate completion of PE for patients with comorbid PTSD/SUD. Providing PE within residential SUD treatment may thus reflect a cost-effective means of treating both disorders simultaneously and improving long-term outcomes. These feasibility and preliminary efficacy data suggest that further study of PE for patients with concurrent PTSD/SUD is warranted. The stage model of treatment research ([Onken, Blaine, & Battjes, 1997](#); [Rounsaville, Carroll, & Onken, 2001](#)) would suggest that this preliminary (Stage 1) nonrandomized study supports the need for further research, including a Stage 2 randomized controlled trial where PE could be compared to TAU in a sample with adequate power to evaluate the incremental benefit of adding PE.

Our experience offering PE for the first time in an existing SUD program brought to light several considerations. We set out to provide PE per protocol with minimal modification and found that this was in fact possible. Modifications were limited to providing sessions three times a week, discussing relapse prevention to substance use in the final session of the protocol, and reminding patients to use skills they were learning in other areas of their treatment (e.g., anger management) to help them with PE. We found that the structure of residential treatment likely contributed to improved treatment engagement. Although it was made clear to patients that their decision to participate in PE was entirely optional and would not influence their status within the program, all patients who were offered PE not

only agreed to this option, but also completed treatment. That is, patients could have discontinued PE at any time and chosen to engage in TAU; the fact that all patients completed PE leads us to conclude that the residential setting can be opportune for motivating and engaging patients in this protocol.

We also found that several factors of a residential SUD program needed to be considered to offer PE successfully. We found that support of other providers on the unit was critical. For example, flexibility in the discharge date allowed us to complete a full course of PE while the patient was still in the residential program. Some patients returned to communities that were hundreds of miles away so completing treatment postdischarge may not have been possible. The support of the clinic coordinator and program director were needed to extend the length of stay; this flexibility and support was a key advantage of implementing this treatment within the VA system. Other health care systems may not allow for such accommodations, which may serve as a barrier to providing PE in other residential SUD settings. Support from other providers was also important so that patients could hear a consistent message about their treatment (e.g., that PE can help with their recovery) and so that the treatment team could have good communication about the patient's progress. Support was also needed to help find time for PE (three weekly 90-minute sessions plus about another hour a day for practice assignments) in a unit that had approximately 40 hours a week of group and other programming. Therefore, we needed the cooperation of other providers to find flexibility in patients' schedules and make some occasional changes to patients' schedules. We saw that some providers became "fans" of PE after they saw the changes in their patients over the course of treatment. For an SUD unit trying to implement PE or other trauma-focused treatment, having a small number of "pilot patients" may help with this critical buy-in. Relatedly, we found that having a champion of PE (in our case, the unit psychologist) was very helpful in identifying appropriate patients and clearing potential barriers such as scheduling conflicts. Although we examined PE on a residential SUD unit, the challenges we encountered were similar to those identified by Cook et al. (2013) for implementing PE in residential PTSD treatment. Specifically, they also noted the need for more frequent sessions and the critical need for buy-in from the clinical team.

Berenz and colleagues (2012) noted that some of the most common challenges to implementing PE in residential SUD treatment they came across were staffing issues, insufficient training of staff, lack of management support, and lack of physical resources. The hospital setting helped to address some of these challenges in that there were trained mental health providers and there were physical resources such as office space that could be

utilized. While these resources allowed us to successfully complete this small feasibility study, if larger studies show that full-scale implementation of PE is warranted, additional resources would be needed, for example, providers trained in PE allocated to the residential SUD unit with access to private offices.

Henslee and Coffey (2010) noted several logistical recommendations for offering PE in residential SUD treatment. While they gave many suggestions for virtual exposures (e.g., listening to sounds or viewing images on a computer), we found the hospital setting ripe for in-vivo exposures that were tailored to each particular patient's exposure hierarchy. For example, for a patient who had smelled garbage during an assault and had since been triggered by the smell of garbage, we were able to find several places across the hospital where she could have gradual exposure to the smell of garbage, culminating in spending time by the large garbage dumpsters just outside of the hospital. Other examples were spending time in crowded areas of the hospital, small spaces like elevators, making eye contact, not wearing a hat that covered face/eyes, changing style of dress (e.g., not wearing a jacket in doors), and changing seating location in cafeteria and waiting rooms. Patients also practiced exposure assignments while on passes in the community and our collaboration with the clinical team allowed for some additional passes specifically to work on in-vivo exposures.

Several limitations to this preliminary study should be noted. Unfortunately, we did not have data on substance use outcomes. PTSD and depression symptoms were measured by self-report rather than standardized diagnostic interview. Patients were not randomly assigned to PE or TAU. Although multiple efforts were made, we were unable to reach a large number of patients for follow-up assessment. A bias in the data is possible in that patients who relapsed may have been less likely to be reachable for follow-up. Participants in this study were mostly White, non-Hispanic/Latino. While our ethnic/racial distribution is representative of the SARRTP unit and comparable to previous SUD studies within the VA (e.g., Worley, Trim, Tate, Hall, & Brown, 2010), it may limit generalizability to minority groups. Future studies should try to include a higher percentage of minorities. Because of these factors and the small sample size, results should be interpreted with caution.

Having an SUD can be a barrier to receiving best practice PTSD treatment. Evidence to suggest that outpatients with SUD can handle and benefit from PTSD treatment is growing (Roberts et al., 2014). However, little is known about the residential SUD setting. This barrier is often attributed to provider beliefs that individuals who are in need of the residential level of SUD care are too vulnerable to tolerate an exposure based PTSD treatment such as PE. Our preliminary data

did not support this clinical lore. Rather, it appears that very complicated patients were able to complete PE because of the structure and support they received in the residential program. Our data suggest PE while in residential SUD care may help with continued post-discharge recovery. Future research using well-powered, randomized designs will further inform whether and for whom PE will be most helpful in residential treatment.

References

- Attkisson, C. C., & Greenfield, T. K. (1994). Client Satisfaction Questionnaire-8 and Service Satisfaction Scale-30. In M. Maruish (Ed.), *The use of psychological testing for treatment planning and outcome assessment* (pp. 402–420). Hillsdale, NJ: Lawrence Erlbaum Associates.
- 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*(3), 277–292.
- Berenz, E. C., Rowe, L., Schumacher, J. A., Stasiwicz, P. R., & Coffey, S. F. (2012). Prolonged exposure therapy for PTSD among individuals in a residential substance use treatment program: A case series. *Professional Psychology: Research and Practice, 43*(2), 154.
- 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*(8), 669–673.
- Brady, K. T., Back, S. E., & Coffey, S. F. (2004). Substance abuse and posttraumatic stress disorder. *Current Directions in Psychological Science, 13*(5), 206–209.
- Brown, P. J., Stout, R. L., & Mueller, T. (1996). Posttraumatic stress disorder and substance abuse relapse among women: A pilot study. *Psychology of Addictive Behaviors, 10*(2), 124.
- Brown, P. J., Stout, R. L., & Mueller, T. (1999). Substance use disorder and posttraumatic stress disorder comorbidity: Addiction and psychiatric treatment rates. *Psychology of Addictive Behaviors, 13*(2), 115.
- Calabrese, J. R., Prescott, M., Tamburrino, M., Liberzon, I., Slembariski, R., Goldmann, E., ... Galea, S. (2011). PTSD comorbidity and suicidal ideation associated with PTSD within the Ohio Army National Guard. *Journal of Clinical Psychiatry, 72*(8), 1072.
- Cook, J. M., Dinnen, S., O'Donnell, C., Bernardy, N., Rosenheck, R., & Desai, R. (2013). Iraq and Afghanistan Veterans: National findings from VA residential treatment programs. *Psychiatry, 76*(1), 18.
- Driessen, M., Schulte, S., Luedecke, C., Schaefer, I., Sutmann, F., Ohlmeier, M., ... Havemann-Reinicke, U. (2008). Trauma and PTSD in patients with alcohol, drug, or dual dependence: A multicenter study. *Alcoholism: Clinical and Experimental Research, 32*(3), 481–488.
- Edens, E. L., Kasprow, W., Tsai, J., & Rosenheck, R. A. (2011). Association of substance use and VA service-connected disability benefits with risk of homelessness among veterans. *The American Journal on Addictions, 20*(5), 412–419.
- Foa, E., Hembree, E., & Rothbaum, B. O. (2007). *Prolonged exposure therapy for PTSD: Emotional processing of traumatic experiences therapist guide*. New York: Oxford University Press.
- Foa, E. B., Yusko, D. A., McLean, C. P., Suvak, M. K., Bux, D. A., Oslin, D., ... Volpicelli, J. (2013). Concurrent naltrexone and prolonged exposure therapy for patients with comorbid alcohol dependence and PTSD. *Journal of the American Medical Association, 310*(5), 488–495.
- Fontana, A., Rosenheck, R., & Desai, R. (2012). Comparison of treatment outcomes for veterans with posttraumatic stress disorder with and without comorbid substance use/dependence. *Journal of Psychiatric Research, 46*(8), 1008–1014.
- Henslee, A. M., & Coffey, S. F. (2010). Exposure therapy for posttraumatic stress disorder in a residential substance use treatment facility. *Professional Psychology: Research and Practice, 41*(1), 34.
- Institute of Medicine. (2007). *Treatment of posttraumatic stress disorder: An assessment of the evidence*. Washington, DC: The National Academies Press.
- 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*(8), 1184–1190.
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the national comorbidity survey. *Archives of General Psychiatry, 52*(12), 1048–1060.
- Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals, 32*(9), 509–515.
- Mee-Lee, D., Shulman, G. D., Fishman, M., Gastfriend, D. R., & Griffith, J. H. (2001). *ASAM patient placement criteria for the treatment of substance related disorders, second edition-revised (ASAM PPC-2R)*. Chevy Chase, MD: American Society of Addiction Medicine.
- Mills, K. L., Teesson, M., Back, S. E., Brady, K. T., Baker, A. L., Hopwood, S., ... Ewer, P. L. (2012). Integrated exposure-based therapy for co-occurring posttraumatic stress disorder and substance dependence. *Journal of the American Medical Association, 308*(7), 690–699.
- Onken, L. S., Blaine, J. D., & Battjes, R. (1997). Behavioral therapy research: A conceptualization of a process. In S. W. Henggeler & R. Amentos (Eds.), *Innovative approaches from difficult to treat populations* (pp. 477–485). Washington, DC: American Psychiatric Press.
- Ouimette, P. C., Finney, J. W., & Moos, R. H. (1999). Two-year posttreatment functioning and coping of substance abuse patients with posttraumatic stress disorder. *Psychology of Addictive Behaviors, 13*, 105–114.
- Petrakis, I. L., Rosenheck, R., & Desai, R. (2011). Substance use comorbidity among veterans with posttraumatic stress disorder and other psychiatric illness. *The American journal on addictions, 20*(3), 185–189.
- Pitman, R. K., Altman, B., Greenwald, E., Longpre, R. E., Macklin, M. L., Poire, R. E., & Steketee, G. S. (1991). Psychiatric complications during flooding therapy for posttraumatic stress disorder. *Journal of Clinical Psychiatry, 52*, 17–20.
- Possemato, K., Wade, M., Andersen, J., & Ouimette, P. (2010). The impact of PTSD, depression, and substance use disorders on disease burden and health care utilization among OEF/OIF veterans. *Psychological Trauma: Theory, Research, Practice, and Policy, 2*(3), 218.
- Powers, M. B., Halpern, J. M., Ferenschak, M. P., Gillihan, S. J., & Foa, E. B. (2010). A meta-analytic review of prolonged exposure for posttraumatic stress disorder. *Clinical Psychology Review, 30*, 635–641.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Roberts, N. P., Roberts, P. A., Jones, N., & Bisson, J. I. (2014). Psychological interventions for post-traumatic stress disorder and comorbid substance use disorder. *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD010204, <http://dx.doi.org/10.1002/14651858.CD010204.pub2>.
- Rounsaville, B. J., Carroll, K. M., & Onken, L. S. (2001). A stage model of behavioral therapies research: Getting started and moving on from stage I. *Clinical Psychology: Science and Practice, 8*, 133–142.
- Seal, K. H., Cohen, G., Waldrop, A., Cohen, B. E., Maguen, S., & Ren, L. (2011). Substance use disorders in Iraq and Afghanistan veterans in VA healthcare, 2001–2010: Implications for screening, diagnosis and treatment. *Drug and Alcohol Dependence, 116*(1), 93–101.
- Substance Abuse and Mental Health Services Administration, Office of Applied Studies. (2008). *Treatment episode data set (TEDS):1996–2006. National Admissions to Substance Abuse Treatment Services* (DHHS Publication No. SMA 08 – 4347). Retrieved from <http://www.oas.samhsa.gov/DASIS.htm#teds>
- Tull, M. T., Gratz, K. L., Coffey, S. F., Weiss, N. H., & McDermott, M. J. (2013). Examining the interactive effect of posttraumatic stress

- disorder, distress tolerance, and gender on residential substance use disorder treatment retention. *Psychology of Addictive Behaviors*, 27, 763–773.
- VA/DoD Management of Post-Traumatic Stress Working Group. (2010). VA/DoD clinical practice guidelines for management of post-traumatic stress, version 2.0. Washington DC: Department of Veterans Affairs, Department of Defense. Available from: <http://www.healthquality.va.gov/PTSD-FULL-2010c.pdf>
- Weathers, F., Litz, B., Herman, D., Huska, J., & Keane, T. (October 1993). *The PTSD Checklist (PCL): Reliability, Validity, and Diagnostic Utility*. Paper presented at the Annual Convention of the International Society for Traumatic Stress Studies, San Antonio, TX.
- Worley, M. J., Trim, R. S., Tate, S. R., Hall, J. E., & Brown, S. A. (2010). Service utilization during and after outpatient treatment for comorbid substance use disorder and depression. *Journal of Substance Abuse Treatment*, 39, 124–131.
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