Published in final edited form as:
Neuropharmacology. 2012 February ; 62(2): 607–616. doi:10.1016/j.neuropharm.2011.05.028.

Emerging Interventions for PTSD: Future Directions for Clinical Care and Research

Jessica Bomyea[1] and **Ariel J. Lang**[2]

[1]San Diego State University/University of California, San Diego Joint Doctoral Program in Clinical Psychology

[2]VA San Diego Healthcare System Center of Excellence for Stress and Mental Health and University of California, San Diego

Abstract

Efficacious therapeutic approaches for treating Posttraumatic Stress Disorder (PTSD) are needed given the significant psychosocial and physical impairment associated with the disorder (e.g., Hidalgo & Davidson, 2000; Jaycox & Foa, 1999; Stein, McQuaid, Pedrelli, Lenox & McCahill, 2000). Although variations of cognitive behavioral therapy (CBT) effectively treat PTSD, non-response rates and dropout rates remain relatively high (Bradley, Greene, Russ, Dutra, & Westen, 2005; Schottenbauer, Glass, Arnkoff, Tendick & Gray, 2008). Thus, treatment outcome research is needed to improve the effectiveness of existing protocols, particularly within specific populations, develop new approaches for treating individuals who cannot access or do not benefit from traditional treatments, and evaluate the types of treatment that may be effective for particular individuals. The present review provides an overview of emerging treatment approaches for PTSD that attempt to address these remaining issues in the treatment outcome literature.

1. Introduction

Posttraumatic stress disorder (PTSD) is a psychopathological response to exposure to a traumatic stressor and is characterized by recurrent re-experiencing of the event, avoidance of reminders of the trauma, emotional numbing and withdrawal, and hyper-arousal (American Psychiatric Association, 2000). Prevalence estimates suggest that about 8% of the general population is affected by PTSD (Kessler, Chiu, Demler, & Walters, 2005). The disorder typically follows a chronic course, and leads to significant work and social impairment and increased healthcare utilization (e.g., Hidalgo & Davidson, 2000; Jaycox & Foa, 1999; Stein, McQuaid, Pedrelli, Lenox & McCahill, 2000). Given the number of affected individuals and significance of functional impairment the disorder results in substantial personal and societal costs.

Empirical study from the past three decades supports the use of exposure-based therapy, such as Prolonged Exposure (PE; Foa & Rothbaum, 1998; for a review see Ponniah & Hollon; for a recent meta-analysis see Powers, Halpern, Ferenschak, Gilihan, & Foa, in press), for treatment of this condition. Cognitive therapies, including Cognitive Processing Therapy (CPT; Resick & Schnicke, 1992), also have a good evidence base suggesting that they reduce PTSD symptoms (e.g., Chard, 2005; Ehlers et al., 2003; Monson et al., 2006;

Resick et al., 2008; Resick, Nishith, Weaver, Astin, & Feuer, 2002). Empirical support also exists for Eye Movement Desensitization Reprocessing Therapy (EMDR; Shapiro et al., 1999). Although some studies of EMDR have been questioned on methodological grounds (e.g., Taylor et al., 2003; Rothbaum, Astin, & Marsteller, 2005), a number of recent reviews (e.g., Spates, Koch, Cusack, Pagoto, & Waller, 2009; Nathan & Gorman, 2007; Ponniah & Hollon, 2009) and meta-analyses (e.g., Bisson, et al., 2007; Seidler & Wagner, 2006) conclude that EMDR is an effective treatment for PTSD. In reviewing the body of evidence for PTSD treatments to date, the recent Institutes of Medicine report (2008), however, concluded that only approaches that include an exposure component currently have sufficient evidence to be considered efficacious.

In spite of these existing approaches, there remains a need for additional PTSD treatment approaches because no single intervention is universally effective, acceptable and/or feasible (Bradley, Greene, Russ, Dutra, & Westen, 2005; Schottenbauer, Glass, Arnkoff, Tendick & Gray, 2008). Also, research surveying clinician attitudes toward exposure therapy suggests that many therapists feel uncomfortable using these treatments and infrequently use them (e.g., Becker, Zayfert, & Anderson, 2004). Thus, it is important to develop novel intervention approaches that may effectively treat PTSD in those who are unresponsive to available empirically supported approaches or who prefer a different type of intervention. Ultimately, it will be important to understand predictors of treatment response to aid clinical judgment about which treatments will be effective for which individuals.

This review provides an overview of novel treatment approaches and important modifications to established approaches based on mode of delivery or the target population. We include approaches with initial or preliminary empirical support, as well as those with a strong theoretical basis that are currently being evaluated for efficacy (see also Cukor, Spitalnick, Difede, Rizzo, & Rothbaum, 2009). Reviewed studies are constrained to psychosocial treatments for adults, organized based on the theoretical rationale for the treatment. Our objective is to review interventions that are novel and relatively understudied at this point in time, in an effort to highlight areas that will likely be addressed in future treatment outcome research.

2. Novel Interventions

We consider novel interventions to be those that have a theoretical basis that differs from those that underlie the established approaches. When sufficient data permits we report effect sizes of PTSD symptom change (Cohen's *d* for between-group changes when a comparison group is used or the standardized mean change *g* for either within-group change in the case of open trials; see Table 1).

2.1 Interpersonal Psychotherapy (IPT)

Interpersonal therapy (IPT; Weissman, Markowitz, Klerman, 2007; Markowitz, Milrod, Bleiberg, & Marhsall, 2009) is an empirically supported treatment originally developed to modify the social context of individuals with depression (e.g., de Mello, Mari, Bacaltchuk, Verdeli, & Neugebauer, 2005). Although the treatment was developed over thirty years ago, only recently has IPT been empirically evaluated for other disorders, including PTSD. IPT as applied to PTSD emphasizes the impact of the traumatic event on interpersonal behavior, with a focus on the individual's role disputes, role transitions, and loss, in an effort to both improve social functioning and decrease PTSD symptoms (Markowitz, 2010). There is reason to believe that IPT may be useful for patients with PTSD. PTSD is associated with significant social impairment (Schnurr, Lunney, Bovin, & Marx, 2009), and many symptoms of PTSD manifest in the context of social relations, including feelings of detachment, social withdrawal and isolation, irritability and angry outbursts, and lack of

trust of others (APA, 2000). Further, deterioration in social functioning is one of the strongest predictors of return for additional care after initial treatment, suggesting the importance of addressing this domain in treatment (Fontana & Rosenheck, 2010).

Few studies have evaluated IPT for PTSD and the estimated effect sizes vary widely (see Table 1), but preliminary results appear promising. In a pilot study of 14 individuals who completed IPT, 12 individuals no longer met diagnostic criteria for PTSD at post-test, and overall participants experienced significant reductions in PTSD symptoms, depression, anger, and social functioning (Bleiberg & Markowitz, 2005). In a second open trial, Robertson, Rushton, Batrim, Moore and Morris (2007) found that an eight-week IPT program led to decreased symptoms of PTSD and improved mood and general health ratings in 13 individuals. PTSD and depression symptom improvements have also been documented in Veteran samples completing IPT (Ray & Webster, 2010). Moreover, in a study that randomly assigned women to IPT or a waitlist control, PTSD and depression symptom reduction was relatively greater in the IPT group that those in the waitlist group (Krupnick et al., 2008). Given its promise and different theorized mechanism from other PTSD treatment approaches, the effects of IPT have also been evaluated for individuals who are non-responsive to other treatment. Campanini et al. (2010) provided IPT to 40 individuals who continued to have PTSD after an adequate pharmacology trial. Results indicated that after IPT, these individuals on average had lower PTSD, depression, and general anxiety and distress symptoms.

2.2. Acceptance and Commitment Therapy

The “third wave” psychotherapies, such as Acceptance and Commitment Therapy (ACT), Dialectical Behavior Therapy (DBT) and Mindfulness Based Cognitive Therapy, aim to modify the relationship between the individual and psychological experiences, rather than focusing on reduction of symptomatology (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). In recent years, interest in these treatments has rapidly increased (e.g., Hayes, 2008), but only ACT has been empirically evaluated in PTSD.

These third wave therapies share the use of mindfulness to emphasize one's ability to allocate attention and awareness to the current moment, including internal experiences and environmental stimuli. In addition, these interventions emphasize acceptance of such experiences rather than passing judgment or attempting to control these experiences (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bishop et al., 2004). Empirical data suggest that mindfulness qualities are positively associated with better psychological health and negatively associated with general distress (e.g., depression, anxiety; Vujanociv, Niles, Pietrefesa, Schmertz, & Potter, 2011). ACT includes mindfulness with the aim of decreasing experiential avoidance (i.e., efforts to blunt distressing inner experiences) and increasing the ability to be present in the current moment (Hayes, Strosahl, & Wilson, 1999). Additionally, ACT helps the individual to articulate his/her values and make behavioral changes that are consistent with these ideals. Published trials indicate that ACT is effective relative to waitlist control, TAU, and psychological placebo for disorders such as depression (e.g., Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009) and is comparable to cognitive therapy for depression and anxiety (Forman, Herbert, Moitra, Yeomans, & Geller, 2007).

PTSD is characterized by ineffective attempts to control and regulate internal experiences, including attempts to avoid memories and feelings associated with trauma. This experiential avoidance is associated with the maintenance or exacerbation of PTSD over time (Tull, Gratz, Salters, & Roemer, 2004), suggesting that ACT may be a useful intervention for this population. Data from open trials with inpatient veterans with PTSD indicate that ACT was associated with decreased PTSD symptoms and depression from pre to post treatment (Walser et al., 2005). ACT was also associated with increased self-reported acceptance and

decreased thought suppression (Ulmer et al., 2005). Varra and colleagues (2009) also evaluated ACT for veterans with PTSD. Results from that open trial similarly showed clinically significant decreases in PTSD and depression. Future research is needed to fully evaluate the effectiveness of this treatment for PTSD. In an effort to better understand the potential efficacy of ACT for Veterans, we are currently conducting a multi-site RCT of ACT. With a single trial reporting sufficient data to calculate an effect size, it is premature to comment on the potential efficacy of the approach. ACT merits further evaluation, however, based on its strong theoretical rationale and evidence base in other conditions (see Ost, 2008 for a meta analysis).

2.3. Mantram Repetition

After a traumatic event, individuals may feel a foreshortened sense of future in conjunction with changes in the strength or nature of their spiritual or religious beliefs (Fontana & Rosenheck, 2004). Given the effect of trauma on these types of beliefs, psycho-spiritual interventions have been considered as a complimentary therapy for the treatment of PTSD. One such intervention, mantram repetition involves selecting a mantram or meaningful phrase (e.g., Shalom), to be repeated during times of stress. The mantram is used to create a state of relaxation when autonomic arousal is high, effectively interrupting the fight or flight response (Bormann, Thorp, Wetherell, & Golshan, 2008). Other components of the treatment involve using mantram repetition to decrease reactivity to the environment and increase mindful, focused attention.

Two studies of mantram repetition suggest it may be a useful adjunct to more traditional treatments for PTSD. In the first, mantram repetition compared to TAU was conducted in a group of combat Veterans to determine feasibility and gather preliminary data on its effectiveness (Bormann et al., 2008). Comparison of the groups indicated that mantram repetition led to lower scores on measures of PTSD and quality of life (Quality of Life Enjoyment and Satisfaction scale: d = .70), and mindfulness (Mindfulness Attention Awareness Scale: d = .72). In the second study comparing mantram repetition therapy to TAU (Borman, Thorp, Wetherall, Golshan, & Lang, in press), results indicated that the mantram repetition group demonstrated significant reduction in self report and interviewer-rated PTSD as well as spiritual wellbeing (Functional Assessment of Chronic Illness Therapy Spiritual Well-being scale: d = .61). Thirty percent of individuals in the mantram group compared to thirteen percent in the TAU group no longer met criteria for PTSD at the end of the intervention. Moreover, drop out was low (6%) and treatment satisfaction was moderate to high in 97% of the mantram sample. Thus, this intervention is well tolerated in this population and appears to impact aspects of spiritual well-being and mindfulness qualities as well as reducing PTSD symptoms. All studies of the approach have been by a single investigative team, however, so other groups should be encouraged to attempt to replicate their results.

2.4. Psychodynamic Therapy

The psychodynamic tradition emphasizes the importance of change in internal dynamics over the course of therapy in an effort to create symptom reduction. Within this framework, transference interpretations based on the therapeutic relationship are used to resolve internal conflict and understand how the patient relates to the world and others. Focusing on the relationship, it is thought, increases insight and as a result improves the patient's functioning (e.g., Johansson et al., 2010). Although psychodynamic therapy is relatively understudied, time-limited psychodynamic treatments have received empirical support. These treatments, based on conceptualizations of trauma-focused psychotherapy outlined by Horowitz et al. (1997), include components designed to increase the patient's awareness of unconscious internal conflicts and develop insight into the patient's difficulties based on transference and

counter transference in the therapeutic relationship (e.g., Krupnick, 2002; Schnyder, 2005). The therapist works with the patient to understand and process underlying beliefs and attitudes that have prevented integration of the traumatic event and to understand the personal meaning of the event.

A number of published case studies outline the conceptual rationale and implementation of psychodynamic approaches with PTSD patients (e.g., Krupnick, 2002; Moss, 2009), but few published randomized trials of psychodynamic treatments exist. Brom, Kleber, and Defares (1989) randomized patients to psychodynamic treatment, hypnotherapy, systemic desensitization, or waitlist. Results revealed the active conditions were equally effective at treating PTSD symptoms and that the psychodynamic treatment was more effective than the waitlist condition on symptoms related to trauma. Thus, although these treatments may appear to be promising based on this single study, future research will be necessary before any conclusions about efficacy can be drawn.

2.5. Modification of Cognitive Processing

Extant empirical data indicate that anxiety disorders are characterized by specific neuropsychological and information processing abnormalities relative to healthy individuals, including biases in attention (e.g., Bar-Haim et al., 2007), interpretation (Amir, Beard, Przeworski, 2005), memory (Mitte, 2008) and executive functioning (Eyesnck, Derakshan, Santos, & Calvo, 2007). Theoretical accounts suggest these abnormalities maintain anxiety by biasing cognition in favor of negative, threatening information. In support of this proposition, a number of studies indicate that information processing characteristics, such as attention and interpretation bias, may be causally implicated in anxiety (e.g., Mathews & MacLeod, 2002; Wilson, MacLeod, Mathews, & Rutherford, 2006). Evidence for a causal relationship between cognitive processes and anxiety symptoms suggests that experimental manipulation of these processes may be a promising treatment target for disorders such as PTSD. PTSD is characterized by at least two forms of aberrant cognitive processing that may be appropriate targets for this type of intervention, including information processing biases and executive functioning deficits.

Experimental psychopathology studies indicate that individuals with PTSD are characterized by information processing biases including attention bias toward threatening cues (e.g., Buckley, Blanchard, & Neill, 2000; Constans, 2005; Pineles, Shipherd, Mostoufi, Abramovitz, & Yovel, 2009; Pineles, Shipherd, Welch, & Yovel, 2007). This bias is thought to contribute to heightened sense of threat and increased distress and, potentially by increasing behavioral avoidance, to prevent the distress associated with encountering threat (e.g., Pineles et al., 2009). Consequently, programs designed to alter this type of “mental habit” by training attentional allocation *away from* threat at a basic information processing level may provide an effective way to both test theoretical models of causality and develop novel interventions. Researchers have utilized a computer-based program to facilitate attention disengagement from threat (relative to neutral stimuli) in individuals with generalized social phobia (Amir et al., 2009; Schmidt, Richey, Buckner, & Timpano, 2009) and generalized anxiety disorder (Amir, Beard, Burns, & Bomyea, 2009). These interventions utilize brief, computer-administered programs completed over relatively short duration (e.g., 6 weeks) to alter these “mental habits”. In spite of their brevity and lack of therapist contact, results from these studies indicate that individuals in these programs demonstrate decreased anxiety symptoms relative to those in control groups.

To date no published studies have evaluated the effect of attention modification in individuals with PTSD. However, pilot data from ongoing trials of attention modification programs in PTSD samples is promising (Amir et al., personal communication). For example, a preliminary feasibility study of 29 active duty military participants given

attention modification in addition to treatment as usual demonstrated that participants experienced a significant decrease in symptoms [assessed using the Posttraumatic Stress Disorder checklist (PCL-M) and Beck Depression Inventory –II (BDI-II)]. In addition, data from a pilot study of 37 PTSD in-patients randomized to TAU, TAU plus attention modification, or TAU plus the attention control condition indicate that individuals in the combined treatment condition demonstrated relatively greater decreases in symptoms on the PCL-M and BDI-II relative to those in the TAU plus attention control condition. In summary, these preliminary data and the success of these programs in treating other anxiety disorders in a relatively brief and cost efficient manner points to their potential utility for PTSD. Trials evaluating this type of intervention are currently being conducted (N. Amir, B. Olatunji, personal communication).

Executive functioning deficits may be another form of cognitive processing suitable to a computer-based intervention. A number of studies demonstrated that specific cognitive deficits related to executive control ability differentiate individuals with and without PTSD (for reviews see Buckley et al., 2000; Constans, 2005; Mathews & MacLeod, 2005). Corroboration for these findings comes from neuroimaging studies indicating that neural activation in areas implicated in executive control appears to be relatively diminished in individuals with PTSD compared to healthy individuals, while areas regulating emotional reactivity are over-active (for reviews see Etkin & Wagner, 2007; Francati, Vermetten, & Bremner, 2007). Recent theoretical accounts of this phenomenon posit that the persistence of these thoughts in clinical disorders such as PTSD stems from deficits in basic cognitive systems that regulate the inhibition of information (e.g., Anderson & Levy, 2009; Joormann, Yoon, & Siemer, 2010; Verwoerd, de Jong, & Wessel, 2008). Consistent with these theories, research suggests that individuals with poor executive functioning performance – particularly on tasks relying on inhibitory control - have difficulty suppressing and regulating intrusive cognitions (e.g., Brewin & Smart, 2005; Verwoerd, Wessel, & de Jong, 2009; Wessel, Overwijk, Verwoerd, & de Vrieze, 2008). Moreover, disorders characterized by intrusive symptoms, such as PTSD, are characterized by difficulty with executive functioning tasks, including those that rely on inhibition (e.g., Constans, 2005). By this theoretical account, doing activities that improve components of executive functioning and thus strengthen prefrontal cortex activation may ameliorate PTSD symptoms (McNally, 2007).

Although no published empirical data on executive functioning training program exists in anxiety, cognitive research suggests that such training can potentially improve executive functioning (e.g., Persson & Reuter-Lorenz, 2007). Recent data also indicates that working memory capacity improvements as a result of such training improve individuals' ability to suppress negative, personally relevant memories (Bomyea & Amir, 2010). Our laboratory is currently conducting a larger-scale clinical trial using this executive functioning training program in a sample of individuals with PTSD to determine the effect of such training on cognitive functioning and symptoms. Clearly this work is in its nascence, but it has the advantage of potentially appealing to those who do not want to engage in traditional psychotherapy.

3. Modified Mode of Delivery: Telemedicine and Computer delivered CBT

The interventions described in this section generally employ exposure-based therapy or cognitive therapy. Thus, they are not departures in terms of the nature of the intervention. They do, however, strive to reduce barriers to accessing effective care for PTSD. There are a number of advantages to delivering CBT by telephone, videoconferencing, computer or Internet. Many people do not live near a provider that is trained in empirically supported approaches or cannot access care for logistical reasons or because of avoidance of leaving

home or traveling. The option to contact a mental health provider remotely may enhance access to good care. Telemedicine and computer-delivered therapy also lends privacy that may appeal to populations concerned about stigma attached to seeking mental health care (e.g., military personnel; Hoge et al., 2004). Meta-analyses suggest this type of intervention is effective for anxiety more generally relative to waitlist and placebo control groups and is equivalent to treatment as usual (TAU) conditions (telehealth: Cuijper et al., 2009; computer-delivered CBT: Reger & Gahm, 2009). A concern about such interventions, however, is that the therapeutic alliance may be compromised thereby rendering the interventions less effective.

Technology-facilitated methods for delivering traditional care remotely typically involve some form of live clinician contact, such as videoconferencing with a therapist. A number of pilot studies have used this type of remote therapy (e.g., Frueh et al., 2007; Morland, Pierce, & Wong, 2004; Tuerk, Yoder, Ruggiero, Gros, & Acierno, 2010; Germain, Marchand, Bouchard, Drouin, & Guay, 2009). In general results suggest that remote therapies show promise as effective treatments for reducing PTSD and general distress. Examination of effect sizes indicates that the magnitude of treatment effects for telehealth delivery versus in-person contact is roughly equivalent (e.g., Germain et al., 2009). Moreover, recent research examining therapist variables indicate that ratings of therapist adherence, rapport building, and expressive empathy are similar across these delivery forms (Frueh et al., 2007).

In addition to CBT delivered remotely through the use of technology, the possibility of using computer-administered CBT (either via written therapist instructions or computer-guided modules) has also been evaluated. Pilot work suggests that programs delivering therapy contents directly via the computer are effective in reducing PTSD symptoms (e.g., Klein et al., 2009). In addition, initial RCTs using computer-assisted interventions indicate this modality effectively decreases PTSD symptoms. Knaevelsrud and Maerker (2007) report that relative to a waitlist control group, individuals (N = 96) randomized to 10 sessions of therapist-assisted internet-based CBT showed decreases in PTSD symptoms. Later analysis indicated that these effects were maintained over an 18-month follow-up period (Knaevelsrud & Maerker, 2010). In a sample of 45 active duty personnel, Litz and colleagues (2007) also demonstrated that relative to internet-based supportive therapy individuals completing the active DESTRESS program demonstrated relatively greater improvement in PTSD symptoms. Ratings from these programs indicate high treatment satisfaction and, in cases where therapist contact is completed (e.g., via email), high ratings of therapeutic alliance (Klein et al., 2009; Knaevelsrude et al., 2007).

Difficulties inherent in the comparison of two active treatments (e.g., large samples required to detect relatively small effects) limit conclusions that can be drawn presently regarding the effects of telehealth CBT relative to traditional in-person approaches. Nonetheless, in trials comparing remote-delivery methods and in-person treatments the effect on PTSD and general distress symptoms appear to be comparable (e.g., Germaine et al., 2009). In addition, the combined data on effectiveness, therapeutic adherence and satisfaction with the therapeutic alliance suggest that interpersonal rapport building may be attainable even when interactions are not “in vivo”. Head-to-head comparison is currently being evaluated in larger scale trials to further evaluate efficacy relative to in-person approaches (e.g., S. Thorp, personal communication). The completion of these non-inferiority trials will facilitate conclusions about whether telehealth CBT can match gold-standard in-person interventions for those who are unable or unwilling to obtain treatment in traditional clinical settings.

4. Adaptations to Target Specific Populations

In this final section, the interventions generally are built upon cognitive behavioral principles, but they have been modified to better meet the needs of specific populations. Up to this point, there has been little differentiation in the treatment of PTSD based on trauma type. These interventions reflect the developing understanding that the nature of the event may affect the challenges faced by the traumatized person and that interventions should be tailored accordingly.

4.1. Cognitive Trauma Therapy for Battered Women

Cognitive Trauma Therapy for Battered Women (CTT-BW; Kubany & Watson, 2002) relies on cognitive behavioral techniques with particular emphasis on guilt. The rationale for this is that guilt-related cognitions that are common to this population (e.g., beliefs about preventability of events, failure to consider retrospective justification for actions and decisions). Also included are components addressing assertiveness skills and prevention of revictimization by the individual's spouse or other future partners.

Two published studies evaluate CTT-BW for this population. In the first, 37 female domestic violence survivors with PTSD were randomly assigned to complete CTT-BW either immediately or after a delay of approximately six weeks (Kubany, Hill, & Owens, 2003). Results indicated that after participation in the active CTT-BW component, women reported lower symptoms of PTSD, depression and guilt, and higher self-esteem scores. Overall, 94% of the women completing the therapy no longer met diagnostic criteria for PTSD at post-assessment, and treatment gains were maintained at 3-month follow up. In the second study, 125 women were assigned to either immediate or delayed CTT-BW (Kubany et al., 2004). PTSD symptoms, depression, self esteem, and guilt were assessed before treatment, at post treatment, and at 3 and 6 month follow up. Consistent with Kubany et al. (2003), women receiving treatment demonstrated relatively greater symptom improvements on PTSD, depression, and guilt scores from pre to post assessment relative to those in the waitlist condition, and gains were maintained at follow up. Given these results, CTT-BW holds promise for this population and, perhaps in a modified form, other traumatized groups characterized by excessive guilt (Kubany & Watson, 2002). These types of interventions are currently being evaluated in female survivors of domestic violence (C. Allard, personal communication) as well as combat veterans (S. Norman, personal communication). It remains to be seen, however, if these modifications improve on gold-standard interventions.

4.2. Adaptive Disclosure

Many models of PTSD focus on the experience of fear during and after trauma. There is growing recognition that combat is not always experienced as fear-provoking but is associated with a spectrum of emotional reactions, including disgust, loss or grief (e.g., Neria & Litz, 2004) and reactions (e.g., guilt and betrayal) to perpetrating or witnessing acts that violate one's moral values – also referred to as “moral injury” (e.g., Litz et al., 2009). Accordingly, Litz and colleagues (see Steenkamp et al., in press) developed a manualized intervention for active duty populations called Adaptive Disclosure (AD) to specifically address grief and moral injury. AD uses a trauma narrative to increase an individual's awareness of strongly held beliefs about the event and to disconfirm maladaptive beliefs about disclosure of the event (cf. PE wherein the narrative is used to foster habituation to the trauma memory). Once beliefs are brought to one's awareness, a variety of techniques, including Socratic questioning, in vivo exposure and the “empty chair” technique are used to modify beliefs. AD also was carefully designed to be respectful of and congruent with military culture. Data from a nonrandomized program evaluation involving 56 Marines showed a positive impact of AD on PTSD, depression, trauma-related cognitions and coping

(Litz, unpublished data). Our group is testing this intervention in a large RCT at the Marine base at Camp Pendelton, California to evaluate efficacy as compared to CPT.

4.3. Narrative Exposure Therapy

Narrative Exposure Therapy (NET) was developed for civilian individuals who have experienced war-related traumas, including torture, terrorism or being a refugee or displaced person. Socioeconomic and political factors, such as extreme poverty and relocation, in conjunction with the severe trauma histories (often including chronic trauma exposure) and cultural/linguistic differences suggest that specifically tailored treatment interventions may be helpful for these individuals (e.g., Neuner, Schauer, Klaschik, Karunakara, & Elbert, 2004).

Drawing on techniques from PE and Testimony Therapy (Cienfuegos & Monelli, 1983), NET (Schauer, Neuner, & Elbert, 2005) attempts integrate and organize the individual's autobiographical memory of the traumatic event and to bring meaning to the experience by allowing the individual to “bear witness” to what they have experienced (Neuner, Schauer, Roth, & Ebert, 2002). This is accomplished by the patient and therapist collaboratively constructing a full biography of the patient's life, including the traumatic events. This process helps the patient to access and process cognitive and emotional reactions to the trauma, while simultaneously creating a written account of the trauma that becomes a history or can contribute to legal proceedings. Similar to exposure-based therapy, NET requires the individual to recount traumatic events in rich emotional detail and, therefore, may help to integrate emotional memories with autobiographical memory (Robjant & Fazel, 2010). NET differs from traditional exposure-based therapy, however, in that the narrative is of the individual's *entire* life (rather than a single “worst” traumatic event) and is not repeated over and over in therapy. NET is also specifically tailoring to be administered in settings such as refugee camps. In addition, NET greatly emphasizes making meaning of and bearing witness to the events.

A growing body of research indicates that NET is a promising treatment for refugee populations. Bichescu, Neuner, Schauer & Elbert (2007) randomly assigned individuals who had been political detainees to NET or psychoeducation treatment. Six months after treatment, the NET group, as compared to the psychoeducation group, experienced relatively fewer symptoms of PTSD and depression. Similarly, Neuner et al. (2004) found that African refugees who were randomly assigned to NET had lower PTSD symptoms at one-year follow-up than those in a psychoeducation group or a supportive counseling group. Neuner et al. (2010) also found that asylum-seekers randomly assigned to NET had relatively better PTSD symptom improvement at six month follow-up relative to those in a TAU condition (although all but one participant in the study continued to meet diagnostic criteria for PTSD). However, in a different sample of African refugees, Neuner and colleagues (2008) found that NET was superior to a no-treatment group, but not a trauma counseling group, on symptoms of PTSD and depression. In a trial of NET versus interpersonal therapy, these two active treatments appear to fare equally well (Schaal, Elbert, & Neuner, 2009). See Robjant and Fazel (2010) for a currently review of published and unpublished trials of NET in children and adults. NET remains to be compared to the well established approaches.

Although NET trials typically conduct assessments later than traditional treatment trials and contain variability in the number and setting of treatments (e.g., in rural communities, hospital settings) they may also possess greater ecological validity and be perceived as very acceptable by these populations. Anecdotal reports from these studies indicate that participants felt the writing of the narrative was both personally meaningful and significant, because although the majority of the individuals could not read, they felt there was value in

making their story accessible to future generations. It is important to note that these trials are typically conducted in individuals who are still experiencing unsafe conditions and persecution, threat of repatriotization (Neuner et al., 2010) and take place in settings with minimal resources, and yet still indicate that NET may possess therapeutic potential for these types of populations. Currently at least one randomized controlled study is underway in the Netherlands to better understand the effect of NET relative to treatment as usual for individuals with Borderline PD and PTSD (Clinicaltrials.gov).

4.4. Imagery Modification

Focusing on anxiety-relevant images has a long history in CBT (for a review see Holmes, Arntz, & Smucker, 2007) and has recently been applied specifically to change images in the context of sleep disturbance. Based on the premise that triggering traumatic imagery activates is distress (e.g., Brett & Orstroff, 1985), the aim of these treatments is to replace trauma-based images with more positive ones to reduce the associated negative emotion (for reviews of theoretical mechanisms see Moore & Krakow, 2010; Long & Quevillon, 2009). Such treatments include Imagery Rehearsal Therapy (IRT; e.g., Krakow et al., 2000) and Exposure, Relaxation, and Rescripting Therapy (ERRT; Davis, 2003). In contrast to exposure, which entails specific review of and habituation to the traumatic memory, imagery based treatments typically minimize recounting of the trauma. Instead, participants are guided to substitute images and nightmares related to trauma with alternate mental images.

Given the high prevalence of sleep disturbances in PTSD, imagery rescripting techniques for nightmares have been specifically examined in this population. Although the exact mechanism of imagery rescripting techniques is unknown, it is theorized that repeated practice “over-writing” the traumatic image with a non-distressing image may increase mastery over nightmare content (Nappi et al., 2010). Support for the approach comes from preliminary randomized trials and open trials (e.g., Krakow et al., 2000; Forbes, Phelps & McHugh, 2001; Lu, Wagner, Van Male, Whitehead, & Boehnlein, 2009; Nappi, Drummond, Thorp, & McQuaid, 2010). To date, three larger RCTs of imagery rescripting techniques for PTSD-related nightmares have been published. Krakow et al. (2001) randomized 168 women with PTSD related to sexual assault to a three-session group IRT protocol or a waitlist control group. At the conclusion of treatment, women in the IRT condition experienced significantly fewer nightmares per week, improved sleep quality, and lower PTSD symptoms than the control group. These treatment gains were maintained at three and six-month follow-up. Davis and Wright (2007) randomly assigned 43 individuals to ERRT or a waitlist. Participants in the ERRT group experienced decreased symptoms of depression, PTSD, and sleep problems. Cook et al. (2010) randomly assigned 124 Vietnam War veterans with PTSD to weekly group IRT or a sleep and nightmare management control group that included psychoeducation and components of CBT for insomnia. Results indicated that the IRT group had not improved significantly more than the control group on nightmare frequency, sleep quality or PTSD. Based on these mixed results, imagery rescripting procedures need further evaluation before implementation (for a review of recent sleep treatments in PTSD see Nappi et al., 2010; this issue).

5. Summary and Discussion

Recent advancements using methodologically sound designs increase confidence that PTSD can be effectively ameliorated using manual-based treatments including exposure, cognitive restructuring, or a combination of the two, as well as using EMDR. The availability of such evidence-based treatments paints a promising view for individuals suffering with PTSD. Nonetheless, a significant portion of individuals remain symptomatic after treatment, drop out of treatment, or never access empirically-supported treatments (Hoge et al., 2004;

Schottenbauer et al., 2008). Thus continued research on PTSD interventions and delivery models is certainly warranted.

Emerging interventions covered in the present review begin to address remaining questions in the PTSD treatment literature. First, there are a set of developing interventions that have different conceptual bases for treating PTSD. These interventions are derived from different theoretical models and emphasize different etiologic and maintenance factors in PTSD. Thus, they may be better suited to patients who are not helped by the well established approaches. For example, IPT may be particularly well suited to individuals whose symptoms are maintained or exacerbated by interpersonal dysfunction. Third wave approaches may be a particularly good fit for those who are compelled by living in accordance with one's values. Cognitive process modification programs provide an option for individuals who are unwilling to participate in traditional psychosocial interventions (e.g., those with high levels of avoidance behavior). A review of the effect sizes of these novel interventions yields considerable variability. In trials examining IPT, effect sizes for this type of intervention appear similar to the range of cognitive behavioral approaches in prior reviews of pre-post change within cognitive behavioral approaches (range 1.4–1.7) and between group change (1.2–1.5; Bradley et al., 2005). These findings, although preliminary, are consistent with studies demonstrating the efficacy of IPT for depression. Other studies, such as those of mantram repetition, appear to have relatively smaller effects on PTSD but do impact outcomes related to mindfulness and spirituality. These findings both highlight the need for future work both establish efficacy and point to the importance of evaluating secondary related variables that may be directly targeted in these specific treatment modalities.

A second set of interventions has attempted to increase accessibility, engagement in, or acceptability of CBT. Remotely delivered treatments capitalize on the accessibility of the World Wide Web and teleheath to disseminate treatments to individuals who might not otherwise access empirically based interventions. These interventions appear beneficial for symptom reduction. In addition, trials presented do not substantiate concerns about difficulty creating or maintaining therapeutic alliance or therapist adherence without face-to-face contact.

Finally, we have reviewed treatments such as CTT, AD, and NET, which tailor CBT for specific populations (i.e., active duty military, refugees). These efforts aim to build upon extant literature regarding the effectiveness of trauma-focused CBT in such a way that treatment outcomes are improved or bolstered for individuals who might otherwise benefit less from these treatments. These approaches appear well-tolerated in their specific populations. However, ultimately, all of these interventions will need to be evaluated against the well established treatments in terms of acceptability and effectiveness.

Reviewing future directions for PTSD treatment research highlights critical questions in the literature that transcend the specific interventions studied. A review of extant treatment outcome literature in PTSD reveals that studies directly examining mechanisms of treatment response are relatively rare (although see for example Smith et al., 2007). It is likely that treatments tapping different targets than CBT do not have entirely distinct mechanisms. For example, techniques requiring the patient to complete activities (e.g., committed action in ACT, in-vivo exposure, interpersonal psychotherapy) inherently contain behavioral activation components. All psychosocial treatments (with the exception of computer-based techniques such as cognitive process modification or Internet based self-help) contain a supportive interpersonal relationship that likely drives a portion of therapeutic change. Thus, relatively little is known about what makes empirically supported interventions effective or how treatments tapping “different” mechanisms might be therapeutic.

Moreover, it has been proposed that interventions might be matched to individuals. Although empirical examination of predictors of outcome is beginning (e.g., Evans, Cowlishaw, & Hopwood, 2009; Iverson, Resick, Suvak, Walling, & Taft, in press; Tarrier, Sommerfield, Pilgrim, & Faragher, 2000), the lack of research on individual-level treatment moderators in RCTs leaves this proposal relatively understudied (although see for example Thrasher, Power, Morant, Marks, & Dalgleish, 2010). To date, no published study has examined the potential for matching treatment protocol based on symptom profile. Knowledge regarding the efficacy of more personalize interventions is thus warranted and will likely emerge in future work. Knowledge derived from these studies will be critical for understanding both who is an ideal candidate for what treatment and may also inform theoretical accounts of PTSD regarding the mechanisms of specific treatments.

In summary, the intervention approaches reviewed show promise for improving PTSD treatment. Because these interventions are in relatively early stages of treatment development, many suffer from methodological limitations such as small samples or lack of randomization. Thus, future work is needed to evaluate efficacy of these treatments using increasingly stringent research methodology. The treatment approaches highlighted here point to future directions for research, including increasing accessibility and acceptability of treatment for specific populations and testing alternative treatment models. In addition, studies designed to better understand the mechanisms of different treatments and inform clinical decision-making about treatment selection have the potential to inform our clinical practice and future research. Ultimately, this knowledge will translate into a better understanding of not only what works, but what works for whom and under what circumstances.

References

American Psychiatric Association. Diagnostic and statistical manual of mental disorders (4th ed., text revision). Author; Washington, DC: 2000.

Amir N, Beard C, Burns M, Bomyea J. Attention modification program in individuals with generalized anxiety disorder. Journal of Abnormal Psychology. 2009; 118(1):28–33. doi:10.1037/a0012589. [PubMed: 19222311]

Amir N, Beard C, Przeworski A. Resolving ambiguity: The effect of experience on interpretation of ambiguous events in generalized social phobia. Journal of Abnormal Psychology. 2005; 114(3): 402–408. doi:10.1037/0021-843X.114.3.402. [PubMed: 16117577]

Amir N, Beard C, Taylor CT, Klumpp H, Elias J, Burns M, Chen X. Attention training in individuals with generalized social phobia: A randomized controlled trial. Journal of Consulting and Clinical Psychology. 2009; 77(5):961–973. doi:10.1037/a0016685. [PubMed: 19803575]

Arntz A, Tiesema M, Kindt M. Treatment of PTSD: A comparison of imaginal exposure with and without imagery rescripting. Journal of Behavior Therapy and Experimental Psychiatry. 2007; 38(4):345–370. doi:10.1016/j.jbtep.2007.10.006. [PubMed: 18005935]

Anderson MC, Levy BJ. Suppressing unwanted memories. Current Directions in Psychological Science. 2009; 18(4):189–194. doi:10.1111/j.1467-8721.2009.01634.x.

Bar-Haim Y, Lamy D, Pergamin L, Bakermans-Kranenburg MJ, van IJzendoorn MH. Threat-related attentional bias in anxious and nonanxious individuals: A meta-analytic study. Psychological Bulletin. 2007; 133(1):1–24. doi:10.1037/0033-2909.133.1.1. [PubMed: 17201568]

Baer RA, Smith GT, Hopkins J, Krietemeyer J, Toney L. Using self-report assessment methods to explore facets of mindfulness. Assessment. 2006; 13(1):27–45. doi:10.1177/1073191105283504. [PubMed: 16443717]

Beard C, Amir N. A multi-session interpretation modification program: Changes in interpretation and social anxiety symptoms. Behaviour Research and Therapy. 2008; 46(10):1135–1141. doi:10.1016/j.brat.2008.05.012. [PubMed: 18675400]

Becker BJ. Synthesizing standardized mean-change measures. British Journal of Mathematical and Statistical Psychology. 1988; 41(2):257–278.

Becker CB, Zayfert C, Anderson E. A survey of psychologists' attitudes towards and utilization of exposure therapy for PTSD. Behaviour Research and Therapy. 2004; 42(3):277–292. doi:10.1016/S0005-7967(03)00138-4. [PubMed: 14975770]

Bichescu D, Neuner F, Schauer M, Elbert T. Narrative exposure therapy for political imprisonment-related chronic posttraumatic stress disorder and depression. Behaviour Research and Therapy. 2007; 45(9):2212–2220. doi:10.1016/j.brat.2006.12.006. [PubMed: 17288990]

Bishop SR, Lau M, Shapiro S, Carlson L, Anderson ND, Carmody J, et al. Mindfulness: A proposed operational definition. Clinical Psychology: Science and Practice. 2004; 11(3):230–241. doi:10.1093/clipsy.bph077.

Bisson JI, Ehlers A, Matthews R, Pilling S, Richards D, Turner S. Psychological treatments for chronic post-traumatic stress disorder: Systematic review and meta-analysis. British Journal of Psychiatry. 2007; 190(2):97–104. doi:10.1192/bjp.bp.106.021402. [PubMed: 17267924]

Bomyea J, Amir N. The Effect of an Executive Functioning Training Program on Working Memory Capacity and Intrusive Thoughts. Manuscript submitted for publication. 2010

Bormann J, Thorp S, Wetherell JL, Golshan S. A spiritually based group intervention for combat veterans with posttraumatic stress disorder: Feasibility study. Journal of Holistic Nursing. 2008; 26(2):109–116. [PubMed: 18356284]

Borman J, Thorp S, Wetherell Golshan, Lang. Psycho-spiritual Mantram Intervention for Veterans with Military-related Posttraumatic Stress Disorder: A Randomized Trial. Journal of Clinical Psychology. in press.

Bradley R, Greene J, Russ E, Dutra L, Westen D. A multidimensional meta-analysis of psychotherapy for PTSD. The American Journal of Psychiatry. 2005; 162(2):214–227. doi:10.1176/appi.ajp.162.2.214. [PubMed: 15677582]

Brett EA, Ostroff R. Imagery and posttraumatic stress disorder: An overview. The American Journal of Psychiatry. 1985; 142(4):417–424. Retrieved from www.csa.com. [PubMed: 3976914]

Brewin CR, Smart L. Working memory capacity and suppression of intrusive thoughts. Journal of Behavior Therapy and Experimental Psychiatry. 2005; 36(1):61–68. doi:10.1016/j.jbtep.2004.11.006. [PubMed: 15687010]

Brom D, Kleber RJ, Defares PB. Brief psychotherapy for posttraumatic stress disorders. Journal of Consulting and Clinical Psychology. 1989; 57(5):607–612. doi:10.1037/0022-006X.57.5.607. [PubMed: 2571625]

Bleiberg KL, Markowitz JC. A pilot study of interpersonal psychotherapy for posttraumatic stress disorder. The American Journal of Psychiatry. 2005; 162(1):181–183. doi:10.1176/appi.ajp.162.1.181. [PubMed: 15625219]

Buckley TC, Blanchard EB, Neill WT. Information processing and PTSD : A review of the empirical literature. Clinical Psychology Review. 2000; 28:1041–1065. [PubMed: 11098399]

Campanini RFB, Schoedl AF, Pupo MC, Costa ACH, Krupnick JL, Mello MF. Efficacy of interpersonal therapy-group format adapted to post-traumatic stress disorder: An open-label add-on trial. Depression and Anxiety. 2010; 27(1):72–77. doi:10.1002/da.20610. [PubMed: 20013958]

Cienfuegos AJ, Monelli C. The testimony of political repression as a therapeutic instrument. American Journal of Orthopsychiatry. 1983; 53(1):43–51. Retrieved from www.csa.com. [PubMed: 6829726]

Chard KM. An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. Journal of Consulting and Clinical Psychology. 2005; 73(5):965–971. doi:10.1037/0022-006X.73.5.965. [PubMed: 16287396]

Constans, JI. Information-processing biases in PTSD. In: Vasterling, JJ.; Brewin, C., editors. Neuropsychology of PTSD: Biological, Cognitive, and Clinical Perspectives. Guilford Press; New York: 2005. p. 105-129.

Cook JM, Harb GC, Gehrman PR, Cary MS, Gamble GM, Forbes D, Ross RJ. Imagery rehearsal therapy for Posttraumatic nightmares: A randomized controlled trial. Journal of Traumatic Stress. 2010; 23:553–563. [PubMed: 20839311]

Cukor J, Spitalnick J, Difede J, Rizzo A, Rothbaum BO. Emerging treatments for PTSD. Clinical Psychology Review. 2009; 29(8):715–726. doi:10.1016/j.cpr.2009.09.001. [PubMed: 19800725]

Davis, JL. Exposure, relaxation, & rescripting therapy: Participant manual. University of Tulsa; Tulsa, OK: 2003.

Davis JL, Wright DC. Randomized clinical trial for treatment of chronic nightmares in trauma-exposed adults. Journal of Traumatic Stress. 2007; 20(2):123–133. doi:10.1002/jts.20199. [PubMed: 17427914]

de Mello MF, de Jesus Mari J, Bacaltchuk J, Verdeli H, Neugebauer R. A systematic review of research findings on the efficacy of interpersonal therapy for depressive disorders. European Archives of Psychiatry and Clinical Neuroscience. 2005; 255(2):75–82. doi:10.1007/s00406-004-0542-x. [PubMed: 15812600]

Ehlers A, Clark DM, Hackmann A, McManus F, Fennell M, Herbert C, Mayou R. A randomized controlled trial of cognitive therapy, a self-help booklet, and repeated assessments as early interventions for posttraumatic stress disorder. Archives of General Psychiatry. 2003; 60(10): 1024–1032. doi:10.1001/archpsyc.60.10.1024. [PubMed: 14557148]

Etkin A, Wagner TD. Functional Neuroimaging of Anxiety: A Meta-Analysis of Emotional Processing in PTSD, Social Anxiety Disorder, and Specific Phobia. American Journal of Psychiatry. 2007; 164:1476–1488. [PubMed: 17898336]

Evans L, Cowlishaw S, Hopwood M. Family functioning predicts outcomes for veterans in treatment for chronic posttraumatic stress disorder. Journal of Family Psychology. 2009; 23(4):531–539. doi: 10.1037/a0015877. [PubMed: 19685988]

Eysenck MW, Derakshan N, Santos R, Calvo MG. Anxiety and cognitive performance: Attentional control theory. Emotion. 2007; 7(2):336–353. doi:10.1037/1528-3542.7.2.336. [PubMed: 17516812]

Falconer E, Bryant R, Felminhgam KL, Kemp AH, Gordon E, Peduto A, Olivieri G, Williams LM. The neural networks of inhibitory control in posttraumatic stress disorder. Journal of psychiatry neuroscience. 2008; 33:413–422. [PubMed: 18787658]

Foa, EB.; Rothbaum, BO. Treating the trauma of rape: Cognitive-behavioral therapy for PTSD. Guilford Press; New York, NY, US: 1998.

Fontana A, Rosenheck R. Trauma, change in strength of religious faith, and mental health service use among veterans treated for PTSD. Journal of Nervous and Mental Disease. 2004; 192(9):579–584. doi:10.1097/01.nmd.0000138224.17375.55. [PubMed: 15348973]

Fontana A, Ronsenheck R. War zone veterans returning to treatment: Effects of social functioning and psychopathology. Journal of Nervous and Mental Disease. 2010; 198:699–707. [PubMed: 20921859]

Forbes D, Phelps A, McHugh T. Treatment of combat-related nightmares using imagery rehearsal: A pilot study. Journal of Traumatic Stress. 2001; 14(2):433–442. doi:10.1023/A:1011133422340. [PubMed: 11469167]

Forman EM, Herbert JD, Moitra E, Yeomans PD, Geller PA. A randomized controlled trial of Acceptance and Commitment Therapy and cognitive therapy for anxiety and depression. Behavior Modification. 2007; 31:772–799. [PubMed: 17932235]

Francati V, Vermetten E, Bremner JD. Funtional Neuroimaging Studies in Posttraumatic Stress Disorder: Review of current methods and findings. Depression and Anxiety. 2007; 24:202–218. [PubMed: 16960853]

Frankl, V. Man's search for meaning. Simon & Schuster; NY: 1959.

Frazier P, Conlon A, Glaser T. Positive and negative life changes following sexual assault. Journal of Consulting and Clinical Psychology. 2001; 69(6):1048–1055. doi:10.1037/0022-006X.69.6.1048. [PubMed: 11777108]

Frueh BC, Monnier J, Grubaugh AL, Elhai JD, Yim E, Knapp R. Therapist adherence and competence with manualized cognitive-behavioral therapy for PTSD delivered via videoconferencing technology. Behavior Modification. 2007; 31(6):856–866. doi:10.1177/0145445507302125. [PubMed: 17932240]

Frueh BC, Monnier J, Yim E, Grubaugh AL, Hamner MB, Knapp RG. A randomized trial of telepsychiatry for post-traumatic stress disorder. Journal of Telemedicine and Telecare. 2007; 13(3):142–147. doi:10.1258/135763307780677604. [PubMed: 17519056]

Germain V, Marchand A, Bouchard S, Drouin M, Guay S. Effectiveness of cognitive behavioural therapy administered by videoconference for posttraumatic stress disorder. Cognitive Behaviour Therapy. 2009; 38(1):42–53. doi:10.1080/16506070802473494. [PubMed: 19235601]

Grunert BK, Weis JM, Smucker MR, Christianson HF. Imagery rescripting and reprocessing therapy after failed prolonged exposure for post-traumatic stress disorder following industrial injury. Journal of Behavior Therapy and Experimental Psychiatry. 2007; 38(4):317–328. doi:10.1016/j.jbtep.2007.10.005. [PubMed: 18037391]

Hayes SC. Climbing our hills: A beginning conversation on the comparison of acceptance and commitment therapy and traditional cognitive behavioral therapy. Clinical Psychology: Science and Practice. 2008; 15(4):286–295. Retrieved from www.csa.com.

Hayes SC, Luoma JB, Bond FW, Masuda A, Lillis J. Acceptance and commitment therapy: Model, processes and outcomes. Behaviour Research and Therapy. 2006; 44

Hayes, SC.; Strosahl, KD.; Wilson, KG. Acceptance and commitment therapy: An experiential approach to behavior change. Guilford Press; New York, NY, US: 1999.

Hidalgo RB, Davidson JRT. Posttraumatic Stress Disorder: Epidemiology and health-related considerations. Journal of Clinical Psychiatry. 2000; 61(7):5–13. [PubMed: 10795604]

Hofmann SG, Asmundson GJG. Acceptance and mindfulness-based therapy: New wave or old hat? Clinical Psychology Review. 2008; 28(1):1–16. doi:10.1016/j.cpr.2007.09.003. [PubMed: 17904260]

Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in iraq and afghanistan, mental health problems, and barriers to care. The New England Journal of Medicine. 2004; 351(1):13–22. doi:10.1056/NEJMoa040603. [PubMed: 15229303]

Holmes EA, Arntz A, Smucker MR. Imagery rescripting in cognitive behaviour therapy: Images, treatment techniques and outcomes. Journal of Behavior Therapy and Experimental Psychiatry. 2007; 38(4):297–305. doi:10.1016/j.jbtep.2007.10.007. [PubMed: 18035331]

Horowitz, MJ.; Marmar, C.; Krupnick, J.; Wilner, N.; Kaltreider, N.; Wallerstein, R. Personality styles and brief psychotherapy. 2nd ed.. Basic Books; New York: 1997.

Institute of Medicine. Treatment of posttraumatic stress disorder: An assessment of the evidence. The National Academies Press; Washington, DC: 2008.

Iverson KM, Resick PA, Suvak MK, Walling S, Taft CT. Intimate partner violence exposure predicts ptsd treatment engagement and outcome in cognitive processing therapy. Behavior Therapy. 2011 doi:10.1016/j.beth.2010.06.003.

Jaycox, LH.; Foa, EB. Cost-effectiveness issues in the treatment of posttraumatic stress disorder. Miller, NE.; Magruder, KM., editors. Oxford University Press; New York, NY, US: 1999. p. 259-269.

Johansson P, Høglend P, Ulberg R, Amlo S, Marble A, Bøgwald K, et al. The mediating role of insight for long-term improvements in psychodynamic therapy. Journal of Consulting and Clinical Psychology. 2010; 78(3):438–448. doi:10.1037/a0019245. [PubMed: 20515219]

Joormann, J.; Yoon, KL.; Siemer, M. Cognition and emotion regulation. In: Kring, AM.; Sloan, DM., editors. Emotion regulation and psychopathology: A transdiagnostic approach to etiology and treatment. Guilford Press; New York, NY, US: 2010. p. 174-203.

Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the national comorbidity survey replication. Archives of General Psychiatry. 2005; 62(6):617–627. doi:10.1001/archpsyc.62.6.617. [PubMed: 15939839]

Klein B, Mitchell J, Gilson K, Shandley K, Austin D, Kiropoulos L, Abbott J, Cannard G. A therapist-assisted internet-based CBT intervention for posttraumatic stress disorder: Preliminary results. Cognitive Behaviour Therapy. 2009; 38(2):121–131. doi:10.1080/16506070902803483. [PubMed: 20183691]

Knaevelsrud C, Maercker A. Internet-based treatment for PTSD reduces distress and facilitates the development of a strong therapeutic alliance: A randomized controlled clinical trial. BMC Psychiatry. 2007; 7 doi:10.1186/1471-244X-7-13.

Knaevelsrud C, Maercker A. Long-term effects of an internet-based treatment for posttraumatic stress. Cognitive Behaviour Therapy. 2010; 39(1):72–77. doi:10.1080/16506070902999935. [PubMed: 19675958]

Krakow B, Hollifield M, Johnston L, Koss M, Schrader R, Warner TD, Tandberg D, Lauriello J, McBride L, Cutchen L, Cheng D, Emmons S, Germain A, Melendrez D, Sandoval D, Prince H. Imagery rehearsal therapy for chronic nightmares in sexual assault survivors with posttraumatic stress disorder: A randomized controlled trial. JAMA: Journal of the American Medical Association. 2001; 286(5):537–545. doi:10.1001/jama.286.5.537.

Krakow B, Hollifield M, Schrader R, Koss M, Tandberg D, Lauriello J, McBride L, Warner TD, Cheng D, Edmond T, Kellner R. A controlled study of imagery rehearsal for chronic nightmares in sexual assault survivors with PTSD: A preliminary report. Journal of Traumatic Stress. 2000; 13(4):589–609. doi:10.1023/A:1007854015481. [PubMed: 11109233]

Krupnick JL. Brief psychodynamic treatment of PTSD. Journal of Clinical Psychology. 2002; 58(8): 919–932. doi:10.1002/jclp.10067. [PubMed: 12115715]

Krupnick JL, Green BL, Stockton P, Miranda J, Krause E, Mete M. Group interpersonal psychotherapy for low-income women with posttraumatic stress disorder. Psychotherapy Research. 2008; 18(5):497–507. doi:10.1080/10503300802183678. [PubMed: 18816001]

Kubany ES, Hill EE, Owens JA. Cognitive trauma therapy for battered women with PTSD: Preliminary findings. Journal of Traumatic Stress. 2003; 16(1):81–91. doi:10.1023/A:1022019629803. [PubMed: 12602656]

Kubany ES, Hill EE, Owens JA, Iannce-Spencer C, McCaig MA, Tremayne KJ, Williams PL. Cognitive trauma therapy for battered women with PTSD (CTT-BW). Journal of Consulting and Clinical Psychology. 2004; 72(1):3–18. doi:10.1037/0022-006X.72.1.3. [PubMed: 14756610]

Kubany ES, Watson SB. Cognitive trauma therapy for formerly battered women with PTSD: Conceptual bases and treatment outlines. Cognitive and Behavioral Practice. 2002; 9(2):111–127. doi:10.1016/S1077-7229(02)80005-0.

Leskin LP, White PM. Attentional networks reveal executive function deficits in posttraumatic stress disorder. Neuropyschology. 2007; 21:275–284.

Litz BT, Engel CC, Bryant RA, Papa A. A randomized, controlled proof-of-concept trial of an internet-based, therapist-assisted self-management treatment for posttraumatic stress disorder. The American Journal of Psychiatry. 2007; 164(11):1676–1683. doi:10.1176/appi.ajp.2007.06122057. [PubMed: 17974932]

Litz BT, Stein N, Delaney E, Lebowitz L, Nash WP, Silva C, Maguen S. Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. Clinical Psychology Review. 2009; 29(8):695–706. doi:10.1016/j.cpr.2009.07.003. [PubMed: 19683376]

Long ME, Quevillon R. Imagery rescripting in the treatment of posttraumatic stress disorder. Journal of Cognitive Psychotherapy.Special Issue: Transdiagnostic Cognitive-Behavioral Treatments for Mood & Anxiety Disorders. 2009; 23(1):67–76. doi:10.1891/0889-8391.23.1.67.

Lu M, Wagner A, Van Male L, Whitehead A, Boehnlein J. Imagery rehearsal therapy for posttraumatic nightmares in U.S. veterans. Journal of Traumatic Stress. 2009; 22(3):236–239. doi:10.1002/jts.20407. [PubMed: 19444882]

Markowitz JC. IPT and PTSD. Depression and Anxiety. 2010; 27:879–881. [PubMed: 20886608]

Markowitz JC, Milrod B, Bleiberg K, Marshall RD. Interpersonal factors in understanding and treating posttraumatic stress disorder. Journal of Psychiatric Practice. 2009; 15(2):133–140. doi:10.1097/01.pra.0000348366.34419.28. [PubMed: 19339847]

Mathews A, MacLeod C. Induced processing biases have causal effects on anxiety. Cognition and Emotion. 2002; 16(3):331–354. doi:10.1080/02699930143000518.

Mathews A, MacLeod C. Cognitive vulnerability to emotional disorders. Annual Review of Clinical Psychology. 2005; 1(1):167–195. doi:10.1146/annurev.clinpsy.1.102803.143916.

McMillen JC, Smith EM, Fisher RH. Perceived benefit and mental health after three types of disaster. Journal of Consulting and Clinical Psychology. 1997; 65(5):733–739. doi:10.1037/0022-006X.65.5.733. [PubMed: 9337492]

McNally RJ. Mechanisms of exposure therapy: How neuroscience can improve psychological treatments for anxiety disorders. Clinical Psychology Review. 2007; 27:750–759. [PubMed: 17292521]

Mitte K. Memory bias for threatening information in anxiety and anxiety disorders: A meta-analytic review. Psychological Bulletin. 2008; 134(6):886–911. doi:10.1037/a0013343. [PubMed: 18954160]

Monson CM, Schnurr PP, Resick PA, Friedman MJ, Young-Xu Y, Stevens SP. Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. Journal of Consulting and Clinical Psychology.Special Issue: Benefit-Finding. 2006; 74(5):898–907. doi: 10.1037/0022-006X.74.5.898.

Moore BA, Krakow B. Imagery rehearsal therapy: An emerging treatment for posttraumatic nightmares in veterans. Psychological Trauma: Theory, Research, Practice, and Policy. 2010; 2(3): 232–238. doi:10.1037/a0019895.

Moore SA, Varra AA, Michael ST, Simpson TL. Stress-related growth, positive reframing, and emotional processing in the prediction of post-trauma functioning among veterans in mental health treatment. Psychological Trauma: Theory, Research, Practice, and Policy. 2010; 2(2):93–96. doi: 10.1037/a0018975.

Morland LA, Pierce K, Wong MY. Telemedicine and coping skills groups for pacific island veterans with post-traumatic stress disorder: A pilot study. Journal of Telemedicine and Telecare. 2004; 10(5):286–289. doi:10.1258/1357633042026387. [PubMed: 15494087]

Moss E. The place of psychodynamic psychotherapy in the integrated treatment of posttraumatic stress disorder and trauma recovery. Psychotherapy: Theory, Research, Practice, Training. 2009; 46(2): 171–179. doi:10.1037/a0016028.

Nappi CM, Drummond SPA, Thorp SR, McQuaid JR. Effectiveness of imagery rehearsal therapy for the treatment of combat-related nightmares in veterans. Behavior Therapy. 2010; 41(2):237–244. doi:10.1016/j.beth.2009.03.003. [PubMed: 20412888]

Nathan, Peter E.; Gorman, JM., editors. A guide to treatments that work. 3rd ed.. Oxford University Press; New York, NY, US: 2007. Retrieved from

Neria Y, Litz BT. Bereavement by traumatic means: The complex synergy of trauma and grief. Journal of Loss and Trauma.Special Issue: Risk and Resiliency Following Trauma and Traumatic Loss. 2004; 9(1):73–87. doi:10.1080/15325020490890660.

Neuner F, Kurreck S, Ruf M, Odenwald M, Elbert T, Schauer M. Can asylum-seekers with posttraumatic stress disorder be successfully treated? A randomized controlled pilot study. Cognitive Behaviour Therapy. 2010; 39(2):81–91. doi:10.1080/16506070903121042. [PubMed: 19816834]

Neuner F, Onyut PL, Ertl V, Odenwald M, Schauer E, Elbert T. Treatment of posttraumatic stress disorder by trained lay counselors in an African refugee settlement: A randomized controlled trial. Journal of Consulting and Clinical Psychology. 2008; 76(4):686–694. doi:10.1037/0022-006X. 76.4.686. [PubMed: 18665696]

Neuner F, Schauer M, Klaschik C, Karunakara U, Elbert T. A comparison of narrative exposure therapy, supportive counseling, and psychoeducation for treating posttraumatic stress disorder in an African refugee settlement. Journal of Consulting and Clinical Psychology. 2004; 72(4):579–587. doi:10.1037/0022 006X.72.4.579. [PubMed: 15301642]

Neuner F, Schauer M, Roth WT, Elbert T. A narrative exposure treatment as intervention in a refugee camp: A case report. Behavioural and Cognitive Psychotherapy. 2002; 30(2):205–210. doi: 10.1017/S1352465802002072.

Ost L-G. Efficacy of the third wave of behavioral therapies: A systematic review and meta analysis. Behaviour Research and Therapy. 2008; 46:296–321. [PubMed: 18258216]

Parsons TD, Rizzo AA. Affective outcomes of virtual reality exposure therapy for anxiety and specific phobias: A meta-analysis. Journal of Behavior Therapy and Experimental Psychiatry. 2008; 39(3): 250–261. doi:10.1016/j.jbtep.2007.07.007. [PubMed: 17720136]

Persson J, Reuter-Lorenz PA. Gaining Control: Training executive function and far transfer of the ability to resolve interference. Psychological Science. 2008; 19:881–888. [PubMed: 18947353]

Pineles SL, Shipherd JC, Mostoufi SM, Abramovitz SM, Yovel I. Attentional biases in PTSD: More evidence for interference. Behaviour Research and Therapy. 2009; 47(12):1050–1057. doi: 10.1016/j.brat.2009.08.001. [PubMed: 19716122]

Pineles SL, Shipherd JC, Welch LP, Yovel I. The role of attentional biases in PTSD: Is it interference or facilitation? Behaviour Research and Therapy. 2007; 45(8):1903–1913. doi:10.1016/j.brat.2006.08.021. [PubMed: 17049337]

Ponniah K, Hollon SD. Empirically supported psychological treatments for adult acute stress disorder and posttraumatic stress disorder: A review. Depression and Anxiety. 2009; 26(12):1086–1109. doi:10.1002/da.20635. [PubMed: 19957280]

Powers MB, Emmelkamp PMG. Virtual reality exposure therapy for anxiety disorders: A meta-analysis. Journal of Anxiety Disorders. 2008; 22(3):561–569. doi:10.1016/j.janxdis.2007.04.006. [PubMed: 17544252]

Powers MB, Halpern JM, Ferenschak MP, Gilihan SJ, Foa EB. A meta-analytic review of prolonged exposure for posttraumatic stress disorder. Clinical Psychology Review. in press.

Powers MB, Zum Vörde Sive Vörding Maarten B. Emmelkamp PMG. Acceptance and commitment therapy: A meta-analytic review. Psychotherapy and Psychosomatics. 2009; 78(2):73–80. doi:10.1159/000190790. [PubMed: 19142046]

Ray R, Webster R. Group interpersonal psychotherapy for veterans with posttraumatic stress disorder: A pilot study. International Journal of Group Psychotherapy. 2010; 60(1):131–140. doi:10.1521/ijgp.2010.60.1.131. [PubMed: 20059298]

Reger MA, Gahm GA. A meta-analysis of the effects of internet- and computer-based cognitive-behavioral treatments for anxiety. Journal of Clinical Psychology. 2009; 65(1):53–75. doi:10.1002/jclp.20536. [PubMed: 19051274]

Resick PA, Galovski TE, Uhlmansiek MO, Scher CD, Clum GA, Young-Xu Y. A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. Journal *of Consulting and Clinical Psychology*. 2008; 76(2):243–258. doi:10.1037/0022-006X.76.2.243. [PubMed: 18377121]

Resick PA, Nishith P, Weaver TL, Astin MC, Feuer CA. A comparison of cognitive-processing therapy with prolonged exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape victims. Journal of Consulting and Clinical Psychology. 2002; 70(4):867–879. doi:10.1037/0022-006X.70.4.867. [PubMed: 12182270]

Resick PA, Schnicke MK. Cognitive processing therapy for sexual assault victims. Journal of Consulting and Clinical Psychology. 1992; 60(5):748–756. doi:10.1037/0022-006X.60.5.748. [PubMed: 1401390]

Rizzo A, Difede J, Rothbaum BO, Reger G, Spitalnick J, Cukor J, McLay R. Development and early evaluation of the *Virtual Iraq/Afghanistan* exposure therapy system for combat-related PTSD. Annals of the New York Academy of Sciences. 2010; 1208:114–125. Doi: 10.1111/j.1749-6632.2010.05755.x. [PubMed: 20955333]

Robertson M, Rushton PJ, Bartrum D, Ray R. Group-based interpersonal psychotherapy for posttraumatic stress disorder: Theoretical and clinical aspects. International Journal of Group Psychotherapy. 2004; 54(2):145–175. doi:10.1521/ijgp.54.2.145.40384. [PubMed: 15104000]

Robjant K, Fazel M. The emerging evidence for narrative exposure therapy: A review. Clinical Psychology Review. 2010; 30(8):1030–1039. doi:10.1016/j.cpr.2010.07.004. [PubMed: 20832922]

Rothbaum BO, Astin MC, Marsteller F. Prolonged exposure versus eye movement desensitization and reprocessing (EMDR) for PTSD rape victims. Journal of Traumatic Stress. 2005; 18(6):607–616. doi:10.1002/jts.20069. [PubMed: 16382428]

Roy MJ, Francis J, Friedlander J, Banks-Williams L, Lande RG, Taylor P, et al. Improvement in cerebtral function with treatment of posttraumatic stress disorder. Annals of the New York Academy of Sciences. 2010; 1208:142–149. Doi: 10.1111/j.1749-6632.2010.05689.x. [PubMed: 20955336]

Schaal S, Elbert T, Neuner F. Narrative exposure therapy versus interpersonal psychotherapy: A pilot randomized controlled trial with Rwandan genocide orphans. Psychotherapy and Psychosomatics. 2009; 78(5):298–306. doi:10.1159/000229768. [PubMed: 19628958]

Schottenbauer MA, Glass CR, Arnkoff DB, Tendick V, Gray SH. Nonresponse and dropout rates in outcome studies on PTSD: Review and methodological considerations. Psychiatry: Interpersonal and Biological Processes. 2008; 71(2):134–168. doi:10.1521/psyc.2008.71.2.134.

Schauer, M.; Neuner, F.; Elbert, T. Narrative exposure therapy: A short-term intervention for traumatic stress disorders after war, terror, or torture. Hogrefe & Huber Publishers; Ashland, OH, US: 2005.

Schmidt NB, Richey JA, Buckner JD, Timpano KR. Attention training for generalized social anxiety disorder. Journal of Abnormal Psychology. 2009; 118(1):514. doi:10.1037/a0013643.

Schnurr PP, Lunney CA, Bovin MJ, Marx BP. Posttraumatic stress disorder and quality of life: Extension of findings to veterans of the wars in Iraq and Afghanistan. Clinical Psychology Review. 2009; 29:727–735. [PubMed: 19744758]

Schnyder U. Why new psychotherapies for posttraumatic stress disorder? Psychotherapy and Psychosomatics. 2005; 74(4):199–201. doi:10.1159/000085142. [PubMed: 15947508]

Seidler GH, Wagner FE. Comparing the efficacy of EMDR and trauma-focused cognitive-behavioral therapy in the treatment of PTSD: A meta-analytic study. Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences. 2006; 36(11):1515–1522. doi:10.1017/S0033291706007963.

Shapiro F. Eye movement desensitization and reprocessing (EMDR) and the anxiety disorders: Clinical and research implications of an integrated psychotherapy treatment. Journal of Anxiety Disorders. Special Issue: Advances in Conceptualization and Research on the Efficacy and Mechanism of EMDR. 1999; 13(1–2):35–67. doi:10.1016/S0887-6185(98)00038-3.

Smith P, Yule W, Perrin S, Tranah T, Dalgleish T, Clark DM. Cognitive behavioral therapy for PTSD in children and adolescents: A preliminary randomized controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry. 2007; 46(8):1051–1061. doi:10.1097/CHI.0b013e318067e288. [PubMed: 17667483]

Spates, CR.; Koch, E.; Cusack, K.; Pagoto, S.; Waller, S. Eye movement desensitization and reprocessing. In: Foa, EB.; Keane, TM.; Friedman, MJ.; Cohen, JA., editors. Effective treatments for PTSD: Practice guidelines from the international society for traumatic stress studies. 2nd ed.. Guilford Press; New York, NY, US: 2009. p. 279-305.

Stein MB, Kennedy CM, Twamley EW. Neuropsychological function in female victims of intimate partner violence with and without Posttraumatic Stress Disorder. Biological Psychiatry. 2002; 52:1079–1088. [PubMed: 12460691]

Stein MB, McQuaid JR, Pedrelli P, Lenox R, McCahill ME. Posttraumatic stress disorder in the primary care medical setting. General Hospital Psychiatry. 2000; 22(4):261–269. doi:10.1016/S0163-8343(00)00080-3. [PubMed: 10936633]

Southwick SM, Gilmartin R, Mcdonough P, Morrissey P. Logotherapy as an adjunctive treatment for chronic combat-related PTSD: A meaning-based intervention. American Journal of Psychotherapy. 2006; 60(2):161–174. Retrieved from www.csa.com. [PubMed: 16892952]

Steenkamp MM, Litz BT, Gray MJ, Lebowitz L, Nash W, Conoscenti L, Amidon A, Lang A. A brief exposure-based intervention for service members with PTSD. Cognitive and Behavioral Practice. 2010 doi:10.1016/j.cbpra.2009.08.006.

Tarrier N, Sommerfield C, Pilgrim H, Faragher B. Factors associated with outcome of cognitive-behavioural treatment of chronic post-traumatic stress disorder. Behaviour Research and Therapy. 2000; 38(2):191–202. doi:10.1016/S0005-7967(99)00030-3. [PubMed: 10661003]

Taylor S, Thordarson DS, Maxfield L, Fedoroff IC, Lovell K, Ogrodniczuk J. Comparative efficacy, speed, and adverse effects of three PTSD treatments: Exposure therapy, EMDR, and relaxation training. Journal of Consulting and Clinical Psychology. 2003; 71(2):330–338. doi:10.1037/0022-006X.71.2.330. [PubMed: 12699027]

Tedeschi, RG.; Calhoun, LG. Trauma & transformation: Growing in the aftermath of suffering. Sage Publications, Inc; Thousand Oaks, CA, US: 1995.

Thrasher S, Power M, Morant N, Marks I, Dalgleish T. Social support moderates outcomes in a randomized controlled trial of exposure therapy and (or) cognitive restructuring for chronic posttraumatic stress disorder. The Canadian Journal of Psychiatry / La Revue Canadienne De Psychiatrie. 2010; 55(3):187–190. Retrieved from www.csa.com.

Tuerk PW, Yoder M, Ruggiero KJ, Gros DE, Acierno R. A pilot study of prolonged exposure therapy for posttraumatic stress disorder delivered via telehealth technology. Journal of Traumatic Stress. 2010; 23(1):116–123. Retrieved from www.csa.com. [PubMed: 20135675]

Tull MT, Gratz KL, Salters K, Roemer L. The role of experiential avoidance in posttraumatic stress symptoms and symptoms of depression, anxiety, and somatization. Journal of Nervous and Mental Disease. 2004; 192(11):754–761. doi:10.1097/01.nmd.0000144694.30121.89. [PubMed: 15505519]

Ulmer, C.; Walser, RD.; Westrup, D.; Rogers, D.; Gregg, J.; Loew, D. Acceptance and Commitment Therapy: Adaptation of a Structured Intervention for the Treatment of PTSD. Presentation at the ACT World Congress; London, England. Jul. 2005

Varra AA, Jakupcak M, Simpson TL. An Acceptance and Commitment Therapy open trial: Group treatment for veterans with PTSD. 2009 Unpublished manuscript.

Verwoerd J, de Jong PJ, Wessel I. Low attentional control and the development of intrusive memories following a laboratory stressor. Journal of Psychopathology and Behavioral Assessment. 2008; 30(4):291–297. doi:10.1007/s10862-008-9080-6.

Verwoerd J, Wessel I, de Jong PJ. Individual differences in experiencing intrusive memories: The role of the ability to resist proactive interference. Journal of Behavior Therapy and Experimental Psychiatry. 2009; 40(2):189–201. doi:10.1016/j.jbtep.2008.08.002. [PubMed: 18929357]

Vujanovic AA, Niles B, Pietrefesa A, Schmertz SK, Potter CM. Mindfulness in the treatment of posttraumatic stress disorder among military veterans. Professional Psychology: Research and Practice. 2011; 42(1):24–31. doi:10.1037/a0022272.

Walser, RD.; Westrup, D.; Gregg, J.; Loew, D.; Rogers, D.; Ulmer, C. ACT for men and women in the treatment of military trauma. Presentation at the ACT World Congress; London, England. Jul. 2005

Weissman, MM.; Markowitz, JC.; Klerman, GL. Clinician's quick guide to interpersonal psychotherapy. Oxford University Press; New York, NY, US: 2007.

Wells A, Sembi S. Metacognitive therapy for PTSD: A preliminary investigation of a new brief treatment. Journal of Behavior Therapy and Experimental Psychiatry. 2004a; 35(4):307–318. doi: 10.1016/j.jbtep.2004.07.001. [PubMed: 15530845]

Wells A, Sembi S. Metacognitive therapy for PTSD: A core treatment manual. Cognitive and Behavioral Practice. 2004b; 11(4):365–377. doi:10.1016/S1077-7229(04)80053-1.

Wells A, Welford M, Fraser J, King P, Mendel E, Wisely J, Knight A, Rees D. Chronic PTSD treated with metacognitive therapy: An open trial. Cognitive and Behavioral Practice. Special Issue: Prevention of Mental Disorders. 2008; 15(1):85–92. doi:10.1016/j.cbpra.2006.11.005.

Wessel I, Overwijk S, Verwoerd J, de Vrieze N. Pre-stressor cognitive control is related to intrusive cognition of a stressful film. Behaviour Research and Therapy. 2008; 46(4):496–513. doi: 10.1016/j.brat.2008.01.016. [PubMed: 18328465]

Wilson EJ, MacLeod C, Mathews A, Rutherford EM. The causal role of interpretive bias in anxiety reactivity. Journal of Abnormal Psychology. 2006; 115(1):103–111. doi:10.1037/0021-843X.115.1.103. [PubMed: 16492101]

Highlights

- Novel PTSD interventions have been proposed, but they are inadequately studied and effect size estimates vary considerably.
- Tailoring of empirically supported treatments to remote delivery formats appears to be generally well tolerated and efficacious.
- Modification of current treatments to specific populations shows promise but merits additional study.

Table 1

Effect sizes of novel interventions of PTSD symptoms

Therapy Type	Study	Sample	Design	Measure	Effect Size
Interpersonal Psychotherapy	Bleiberg & Markowitz, 2005	14 men and women Mixed trauma type	Open trial	CAPS	g = 2.8
				PSS	g = 2.4
	Robertson et al. 2007	13 men and women Mixed trauma type	Open trial	IES – R Avoidance	g = .57
				IES – R Hyperarousal	g = .64
	Campanini et al. 2010	40 men and women Treatment refractory sample	Open trial	CAPS	g = 1.29
	Krupnick et al. 2007	48 women Low income sample	Random assignment: IPT (n = 32) Waitlist (n = 16)	CAPS	d = 1.17
	Ray & Webster, 2010	9 veterans	Open trial	IES - R	ES not available
Acceptance and Commitment Therapy	Varra et al., 2009			CAPS	0.33
	Walser et al., 2005	161 inpatient veterans	Open trial	PCL – M	ES not available
Mantram Repetition	Bormann et al. 2008	29 combat veterans	Random assignment: Mantram repetition (n = 14) Delayed mantram repetition (n = 15)	CAPS	d = 0.33
				PCL	d = 0.72
	Borman et al. in press	136 veterans	Random assignment: Mantram repitition and TAU (n = 66) TAU only (n = 70)	CAPS	d = 0.39
				PCL	d = 0.34
Psychodynamic Therapy	Brom et al. 1989	112 mixed trauma	Random assignment: Psychodynamic treatment (n=29), Hypnotherapy (n=29), Systemic desentization (n=31) Waitlist (n=23)	IES-R	d = 0.67
				SCL-90 Trauma scale	d = 0.83
Attention Modification Program	Amir et al. (unpublished data)	29 Active duty personnel	Open trial	PCL-M	ES not available
		37 Active duty personnel	Randomized to TAU, TAU+AMP, TAU+ACC		

Note: CAPS = Clinician Administered PTSD scale; PSS = Posttraumatic Stress Scale; HRSD IES-R = Impact of Events Scale-Revised; PCL = Posttraumatic Symptoms Check List; SCL-90 = Symptom checklist-90 subscale with trauma-related items; TAU = Treatment as Usual; AMP = Attention Modification Program; ACC = Attention Control Condition. Given the heterogeneity in effect size calculations presented in the open trial studies reviewed, a standard mean change effect size was calculated for each study as per Becker (1998): $g = (x_1 - x_2)/s_{\text{pre-test}}$