Textbook of Anxiety Disorders

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Chapter 33

Psychotherapy for Posttraumatic Stress Disorder

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Historical Background

Throughout the history of psychiatry and psychology, much has been written about the treatment of traumatized individuals, with special attention to combat-related experiences (e.g., Grinker and Spiegel 1944; Hurst 1919). This reflects the wide recognition that chronic psychological disturbances after traumatic experiences are a common occurrence, frequently requiring therapeutic intervention.

Learning theory provides a rich body of knowledge that has influenced current conceptualizations and treatments of traumatic reactions. In this tradition, chronic posttraumatic symptoms were viewed as severe fear reactions. In this tradition, chronic posttraumatic symptoms were viewed as severe fear reactions acquired through Pavlovian conditioning. Indeed, that conceptualization of traumatic reactions as the prototype of pathological fear is exemplified in the work of Dollard and Miller (1950). To illustrate how phobias are learned, the authors describe the case of a fighter pilot who developed extreme fear and avoidance of airplanes after being exposed to intensely fear-provoking stimuli during one of his missions. Rachman’s work (1978) on fear and courage also exemplified the conception of traumatic reactions as rooted in fear and anxiety. To study basic mechanisms of fear and courage, Rachman chose military personnel as subjects for his experiments (as Dollard and Miller had). Correspondingly, Rachman (1980) conceptualized natural processes of recovery from a traumatic event in terms of reductions in anxiety reactions.

The official placement of posttraumatic stress disorder (PTSD) among the anxiety disorders in DSM-III (American Psychiatric Association 1980) acknowledges that anxiety is a common and potentially chronic reaction to trauma. The symptoms of PTSD overlap considerably with those of other anxiety disorders. For example, arousal symptoms such as hypervigilance, sleep disturbances, irritability, and difficulty concentrating are common to both PTSD and generalized anxiety disorder (GAD). Fear and avoidance are common to PTSD, GAD, and specific phobias. Difficulty concentrating is common to both PTSD and generalized anxiety disorder (GAD). Fear and avoidance are common to PTSD, specific phobia, social phobia, and panic disorder with agoraphobia. Furthermore, escape/avoidance behaviors in PTSD sufferers, like many avoidance behaviors in individuals with other anxiety disorders, are driven by the strong desire of anxious individuals to prevent states of high anxiety as well as a tendency toward exaggerating the probability of threat and the cost associated with the threat (Foa and Kozak 1986; Foa et al. 1989b, 1996). Hence, with the codification of PTSD, cognitive-behavioral theories of PTSD have conceptualized the disorder as a phobia with an especially extensive generalization (e.g., Foa et al. 1989b; Keane et al. 1985).
The conceptualization of the acquisition and extinction of pathological fear within learning theory prompted extensive research on the measurement and treatment of fear and anxiety with cognitive-behavioral therapy (CBT) techniques beginning in the 1960s. The first CBT techniques that were successfully applied to treating morbid anxiety were variants of exposure therapy (Foa et al. 1989a). Techniques involving imaginal and in vivo exposure to feared objects, situations, and memories had already been shown to be effective in the treatment of specific phobias (e.g., Bandura et al. 1969; Wolpe 1958), agoraphobia (e.g., Emmelkamp and Wessels 1975; Mathews et al. 1977), public speaking phobia (Paul 1996), and obsessive-compulsive disorder (e.g., Foa and Goldstein 1978; Meyer 1966).

Interestingly, the discovery that people who suffer trauma-related disturbances can be helped by exposure to trauma reminders, including traumatic memories, comes in part from the wide recognition that traumatic reactions are predominately anxiety related. The exposure principle is clearly imbedded in the early literature on treatment of trauma-related disturbances. For example, in 1893 Freud and Breuer described the phenomenon and treatment of hysteria, a condition that would likely be called PTSD in current diagnostic systems; hysterical symptoms disappeared when the therapist succeeded in bringing to light the memory of the traumatic event and the patient then described the event in the greatest possible detail and put the accompanying affect into words (see Freud 1973). A similar formulation was offered by emotional processing theory (Foa and Kozak 1986) and the treatment of PTSD that has ensued from that theory, which is focused on systematic, repeated recounting (i.e., imaginal exposure) of the traumatic memory.

The 1970s witnessed a new development in the area of emotional processing (i.e., imaginal exposure) of the traumatic memory.

The 1970s witnessed a new development in the treatment of anxiety disorders that parallels the development of exposure therapy described above. This approach is called anxiety management training (e.g., Suinn and Richardson 1971) and stress inoculation training (SIT; e.g., Meichenbaum 2007). The basic tenet of this treatment is that anxiety symptoms can be ameliorated by educating patients about anxiety symptoms, teaching them how to manage the symptoms, and providing skills to cope with future stresses and anxiety-evoking situations. SIT has been successfully applied to phobic patients (Meichenbaum 1974).

To understand the continuity between treatment of anxiety disorders developed prior to 1980 and treatments developed specifically for PTSD after 1980, it is important to recognize that researchers studying CBT interventions did not view themselves as developing specific treatments for specific disorders per se. Rather, they viewed themselves as studying processes related to fear reduction in general, with the assumption that knowledge gained from investigating methods of fear reduction with one group of individuals (e.g., those with agoraphobia) would be relevant to fear reduction among other anxious individuals (e.g., those with obsessive-compulsive disorder).

Recognition that the basis of PTSD lies in pathological anxiety and that CBT is effective for anxiety disorders led to the application of these procedures to the treatment of trauma victims with PTSD. Initial reports took the form of case studies of treatment for combat veterans (e.g., Black and Keane 1982; Fairbank and Keane 1982), rape victims (e.g., Rothbaum and Foa 1991; Wolff 1977), and motor vehicle accident victims (Kraft and Al-Issa 1965; Kushner 1965). These early case reports demonstrated trauma experts' recognition that the treatment for anxiety could naturally be applied to trauma-related psychological difficulties.

At first, exposure therapy programs were generally employed with veterans (e.g., Cooper and Clum 1989; Keane et al. 1989), and anxiety management programs such as SIT were generally employed with female assault victims (Veronen and Kilpatrick 1983). Foa et al. (1991) were the first to examine the efficacy of both exposure therapy and SIT with female victims of rape. More recent CBT studies have examined the efficacy of exposure therapy in combination with SIT, cognitive therapy, or other emotion regulation skills and included patients with traumatic experiences other than combat and assault; they included victims of childhood sexual abuse (e.g., Cloitre et al. 2002, refugees (Paunovic and Ost 2001), female assault victims (Foa et al. 1999, 2001), they included victims of childhood sexual abuse, (e.g., Cloitre et al. 2002, refugees (Paunovic and Ost 2001), female assault victims (Foa et al. 1999, 2005), and mixed trauma samples (e.g., Marks et al. 1998). These studies suggested that the addition of SIT or cognitive restructuring did not add to the efficacy of exposure therapy alone (Foa et al. 2003).

In summary, it was widely recognized that trauma-related psychological problems were rooted in fear and anxiety. In the 1960s and 1970s, there was already a great deal of knowledge concerning the effectiveness of CBT, in particular exposure therapy, in reducing anxiety symptoms in a variety of anxiety disorders. The traditional descriptions of successful treatments for posttraumatic disturbances converge with modern developments in the area of PTSD, both advocating exposure to the traumatic memory and re-
minders of the trauma. There was also evidence for the effectiveness of stress inoculation programs for anxiety disorders. In anxiety clinics, where behavioral and cognitive therapies were conducted, trauma victims were viewed as suffering from pathological anxiety and were treated in the same manner as other anxiety patients. These techniques were later validated in larger, randomized studies on trauma-related disturbances and PTSD (e.g., Foa et al. 1991, 1999, 2005; Keane et al. 1989; Marks et al. 1998; Resick et al. 2002).

Cognitive-Behavioral Therapy

Cognitive-Behavioral Interventions for PTSD: An Overview

CBT is not a single technique but rather a broad approach that includes a range of techniques, the goals of which are to reduce the intensity and frequency of distressing negative emotional reactions, to modify erroneous cognitions, and to promote functioning. In the field of PTSD the most-studied and best-supported treatments are all forms of CBT and include exposure therapy, SIT, and variations of cognitive therapy. Each of these interventions has been administered as a primary intervention or combined with other interventions to form a more comprehensive treatment package. A fourth treatment for PTSD that has received empirical support is eye movement desensitization and reprocessing (EMDR; Shapiro 2001), a treatment that utilizes elements of exposure and cognitive restructuring but also includes therapist-directed rapid eye movements or other laterally alternating activities. Two recent innovations in the treatment of PTSD are the application of imagery rehearsal therapy to PTSD-related nightmares and the use of technology to assist in the implementation of CBT, such as the use of virtual reality technology imagery rehearsal therapy to PTSD-related nightmares and the use of technology to assist in the implementation of CBT, such as the use of virtual reality technology to implement exposure therapy and the administration of therapy via the Internet.

Exposure Therapy

PTSD is characterized by the reexperiencing of the traumatic event through intrusive and distressing memories, nightmares, and flashbacks and by strong emotional and physiological reactions triggered by trauma-related reminders. In addition, most individuals with PTSD attempt to ward off the intrusive symptoms and avoid the trauma reminders, even when such trigger stimuli are not inherently dangerous. Given these two broad categories of feared stimuli (the traumatic memories and triggers that are reminders of the trauma), the core components of exposure programs for the disorder are:

1. *Imaginal exposure*, revisiting the traumatic memory, repeatedly recounting it aloud, and processing the revisiting experience

2. *In vivo exposure*, the repeated confrontation with trauma-related situations and objects that evoke excessive anxiety but are not inherently dangerous

The goal of this treatment is to promote processing of the traumatic memory (Foa et al. 2006a) and to reduce distress and avoidance elicited by the trauma reminders. Additionally, individuals with pronounced symptoms of emotional numbing and depression are encouraged to engage in pleasurable activities even if these activities have dropped out of their repertoire due to loss of interest rather than because they elicit fear or anxiety (Foa et al. 2007). The rationale for this is similar to the use of behavioral activation strategies in the treatment of depression (Martell et al. 2001).

Exposure therapy programs that have been evaluated in randomized, controlled studies differ in which exposure techniques are implemented and how they are implemented, along with what other nonexposure techniques are utilized. For example, some researchers have relied exclusively on imaginal exposure (e.g., Bryant et al. 2003a; Cooper and Clum 1989; Keane et al. 1989; Tarrier et al. 1999), whereas Basoglu and colleagues (2005) have relied exclusively on in vivo exposure. By contrast, the prolonged exposure program developed by Foa and colleagues (1991, 1999, 2005, 2007; see also Resick et al. 2002; Rothbaum et al. 2005, 2006; Schnurr et al. 2007) and a similar program developed by Marks and colleagues (1998; see also Richards et al. 1994; Taylor et al. 2003) utilize both imaginal and in vivo techniques (2007) and a similar program developed by Marks and colleagues (1998; see also Richards et al. 1994; Taylor et al. 2003) utilize both imaginal and in vivo techniques. Exposure therapy programs also differ in the extent to which exposure techniques are the primary focus in therapy (they are the primary focus in the programs developed by Foa and colleagues and Marks and colleagues) or are substantially supplemented with other CBT techniques such as stress inoculation and cognitive therapy procedures, as they are in the CBT program developed by Blanchard, Hickling, and colleagues (2003a; Hickling and Blanchard 1997; see also Maercker et al. 2006). In some programs, such as Resick's cognitive processing therapy (CPT) program (a CBT treatment with a smaller imaginal component) and the Blanchard and Hickling program just mentioned, expo-
sure to the traumatic memory is implemented through narrative writing exercises.

**Stress Inoculation Training**

Veronen and Kilpatrick (1983) adopted Meichenbaum’s (2007) SIT approach for the treatment of PTSD symptoms in female rape victims. As applied to PTSD, the SIT program includes education about trauma-related symptoms as well as anxiety management techniques such as controlled breathing and relaxation training, cognitive restructuring, guided (task-enhancing) self-dialogue, assertiveness training, role playing, covert modeling, and thought stopping. Once the various techniques have been introduced, the therapist and patient work together to select and implement the techniques in a flexible manner to address patients’ current concerns or specific symptoms. As with exposure therapy, SIT programs vary from one another, the most notable difference being that some programs include an exposure component (e.g., Veronen and Kilpatrick 1983) whereas others do not (e.g., Foa et al. 1991, 1999). Although interest in the study of SIT for PTSD has diminished, one innovative use of SIT has been to target anger among veterans with chronic PTSD and significant anger problems (Chemtob et al. 1997).

**Cognitive Therapy**

Cognitive therapy for PTSD is derived from Beck’s model of treatment for depression (A.T. Beck et al. 1979) and its extension to anxiety (A.T. Beck et al. 1985), wherein the goal of therapy is to help patients identify trauma-related dysfunctional beliefs that influence emotional and behavioral responses to a situation (Marks et al. 1998; Tarrier et al. 1999). Once these are identified, patients are taught to evaluate the thoughts in a logical, evidence-based manner. Information that is identified, patients are taught to evaluate the thoughts in a logical, evidence-based manner. Information that supports or refutes the belief is examined, as are alternative ways of interpreting the problematic situation. The therapist helps patients weigh the evidence and consider alternative interpretations before deciding whether the belief accurately reflects reality, and, if it does not, to replace or modify it. As with other treatment programs already discussed, cognitive therapy programs differ in the length and number of sessions. Moreover, some cognitive therapy programs include an exposure component—such as Resick’s CPT program (Resick and Schnicke 1992; Resick et al. 2002)—and the cognitive therapy program based on Ehlers’ and Clark’s cognitive theory of PTSD (Ehlers and Clark 2000; Ehlers et al. 2003, 2005)—whereas other cognitive therapy programs do not (e.g., Marks et al. 1998; Tarrier et al. 1999).

**Eye Movement Desensitization and Reprocessing**

In EMDR (Shapiro 1989, 1991, 2001), the therapist asks the patient to generate images, thoughts, and feelings about the trauma; evaluate their aversive qualities; and make alternative cognitive appraisals of the trauma or their behavior during it. As the patient initially focuses on the distressing images and thoughts, and later focuses on the alternative cognition, the therapist elicits rapid, laterally alternating eye movements by instructing the patient to visually track the therapist’s finger as it moves back and forth across the patient’s visual field. Originally, Shapiro (1991) regarded these eye movements as essential to the processing of the traumatic memory, but the importance of the eye movements has not gained empirical support (for a review, see Spates et al. 2008). Some EMDR programs have replaced the eye movement component with other procedures (e.g., having the patient alternate finger tapping from the right to the left hand; Shapiro 2001), indicating that equivalent mechanisms underlie the various procedures. However, dismantling studies have not demonstrated that these movements affect symptom reduction (Cahill et al. 1999), and well-designed research studies assessing treatment outcomes have found no advantage of using EMDR versus exposure therapy alone (Rothbaum et al. 2005; Taylor et al. 2003).

**Outcome of Clinical Trials for Chronic PTSD**

The efficacy of CBT in the treatment of PTSD among adults has been the focus of considerable research in the past 20 years that has been summarized in several narrative and meta-analytic reviews. For example, in the past 20 years that has been summarized in several narrative and meta-analytic reviews. For example, in the second edition of the International Society for Traumatic Stress Studies (ISTSS) treatment guidelines (Foa et al. 2008), Cahill et al. (2008) identified 64 studies in which participants were randomly assigned to some form of CBT or at least one other study group. The single most common comparison was a wait-list control condition (39 studies), though several (19) studies used some form of nonspecific control treatment, such as relaxation, supportive counseling, psychoeducation, or treatment as usual. In addition, 12 studies directly compared two or more CBT programs (excluding EMDR). These included studies of some form of exposure therapy compared with SIT (Foa et al., 1991, 1999) or cognitive therapy (Marks et al. 1998; Resick et al. 2002;
Tarrier et al. 1999), as well as comparisons of individual CBT programs versus combined programs, including exposure therapy plus either SIT or cognitive therapy versus: exposure therapy alone (Foa et al. 1999, 2005; Marks et al. 1998; Paunovic and Ost 2001), SIT alone (Foa et al. 1999), or cognitive therapy alone (Bryant et al. 2003a; Marks et al. 1998; Resick et al. 2008).

Another seven studies directly compared EMDR to some other CBT program (Devilly and Spence 1999; Ironson et al. 2002; Lee et al. 2002; Power et al. 2002; Rothbaum et al. 2005; Taylor et al. 2003; Vaughan et al. 1994), although concerns have been raised about the randomization procedures used in the Devilly and Spence study (1999). Separate chapters on EMDR in the earlier (Chemtob et al. 2000) and revised (Spates et al. 2008) editions of the ISTSS guidelines together identify a total of 18 studies—including the already-mentioned seven studies comparing EMDR to other types of CBT—that either assessed the efficacy of EMDR or attempted to dismantle the components of EMDR, such as eye movements and other laterally alternating stimuli (e.g., finger tapping; Pitman et al. 1996a), and its cognitive restructuring component (Cusack and Spates 1999).

In broad summary of the 75 studies reviewed in the ISTSS guideline chapters (Foa et al. 2008), the vast majority found that treatment with CBT was associated with significant improvement on measures of PTSD symptoms and, frequently, other associated emotional reactions such as depression and anxiety. Moreover, CBT is routinely found to be significantly more efficacious than wait-list control conditions and to be as efficacious as or more efficacious than nonspecific control treatments. However, studies directly comparing different CBT treatments have found only small differences between treatment conditions, differences that generally fail to achieve statistical significance, possibly due to differences in sample size that are not large enough to detect small differences. In addition, the direction of the differences between conditions does not reliably replicate. For example, the first study to directly compare exposure therapy versus SIT (Foa et al. 1991) found some evidence of a slight advantage for SIT, particularly immediately posttreatment, whereas a subsequent study (Foa et al. 1999) found some evidence for a slight advantage for exposure therapy. Similarly, among the seven studies comparing EMDR with some other CBT program, three provided some evidence of a slight advantage for CBT (Devilly and Spence 1999; Rothbaum et al. 2005; Taylor et al. 2003) and three found some evidence of a slight advantage for EMDR (Lee et al. 2002; Power et al. 2002; Vaughan et al. 1994). In the seventh study (Ironson et al. 2002), there was not even a hint of superiority for one treatment over the other. In general, then, the differences between CBT and wait-list conditions are substantially larger than the differences among the various CBT programs, and when differences do occur among active treatments, the direction of the difference is not consistent across studies—suggesting that different CBT programs yield similar degrees of improvement. It is important to note that exposure therapy has gained much more empirical evidence for its efficacy than other forms of CBT, including EMDR.

Just as different CBT programs appear to yield similar improvement, studies that have compared combined CBT programs and the constituent components (e.g., exposure therapy plus SIT vs. exposure therapy alone vs. SIT alone) have generally failed to find significant benefit for the combined treatment compared to the individual treatment. Again, this may in part be attributed to low statistical power to detect small differences due to low sample size, although two relevant studies utilized samples comprising 50 or more participants in each condition. Foa and colleagues (2005) compared exposure therapy alone ($n=79$) versus exposure therapy plus cognitive restructuring ($n=74$). Both treatments were clearly superior to a wait-list control condition, and the degree of improvement from pretreatment to posttreatment, expressed in terms of standard deviation units (i.e., within-group effect sizes), was similar for the two treatments but was numerically larger for the exposure therapy group (Cohen's $d=1.45$) than for the combined condition ($d=1.30$).

Resick and colleagues (2008) compared standard CPT ($n=53$), which includes some exposure through writing and reading a traumatic narrative, with a version of CPT in which writing and reading the traumatic narrative are removed ($n=51$). A third comparison group in this study was one in which participants engaged in repeated writing about the trauma and reading the narrative without any formal cognitive therapy ($n=50$). All three treatments were associated with significant improvement. However, group comparisons conducted posttreatment indicated the CPT treatment without writing was superior to the writing treatment, whereas results with standard CPT were not different from results with either the writing treatment or the CPT variation without the writing component. It should be noted, however, that the writing-only treatment included six sessions conducted every 2 weeks whereas the other two treatments included 12 sessions, each
conducted weekly. This procedural difference might have reduced the efficacy of the writing-only treatment. Thus, Foa et al. (2005) found that adding cognitive therapy did not enhance the combination of imaginal plus in vivo exposure, and Resick et al. (2008) found that omitting exposure via writing and reading the trauma narrative did not reduce the efficacy of CPT.

Dismantling studies of EMDR, in which participants were individuals with PTSD or trauma-related symptoms, indicate that variations of EMDR in which eye movements are replaced by other laterally alternating stimuli (e.g., Pitman et al. 1996a) or simply removed (e.g., Boudewyns and Hyer 1996; Renfrey and Spates 1994)—and in which the formal cognitive restructuring (i.e., “reprocessing”) procedures are replaced with more desensitization trials (Cusack and Spates 1999)—produce similar improvement. As with most studies comparing different CBT programs, the EMDR dismantling studies are limited by small samples with adequate power to detect only large differences between treatment conditions, although the pattern of means in these studies suggests that if there are differences between EMDR and the dismantled variations, the differences are quite small.

Similar conclusions about the general efficacy of different CBT programs were drawn from a meta-analysis of psychotherapy for PTSD by Bradley et al. (2005). These authors reviewed 26 studies that used a total of 44 active treatment conditions, 15 wait-list control conditions, and 8 nonspecific control treatment conditions (e.g., supportive counseling). The mean within-group effect size for active treatments was 1.43 (95% confidence interval [CI], 1.23–1.64), which was superior to that of a wait-list control condition ($d=0.35$; 95% CI, 0.19–0.51) and nonspecific control condition ($d=0.59$; 95% CI, 0.30–0.88). The various specific CBT approaches yielded similar effect sizes with overlapping confidence intervals:

- Exposure therapy: $d=1.57$; 95% CI, 1.11–2.04
- SIT or cognitive therapy: $d=1.65$; 95% CI, 0.96–2.35
- Exposure therapy plus SIT or cognitive therapy: $d=1.66$; 95% CI, 1.18–2.14
- EMDR: $d=1.43$; 95% CI, 1.02–1.83

Somewhat more-guarded conclusions were drawn from a recent meta-analysis conducted under the auspices of the Institute of Medicine (2008). This meta-analysis focused only on the highest quality studies and included in their evaluation consideration of data that were lost due to dropouts and the statistical methods used to deal with such missing data. Based on the study selection criteria used by the Institute of Medicine, the review committee considered 24 randomized, controlled studies of some form of exposure therapy (alone, or in combination with SIT or cognitive therapy; notably, CPT was designated as an exposure therapy for the purposes of this review); 10 studies of EMDR; three studies of cognitive therapy; and four studies of coping skills training, which included SIT treatment and relaxation control conditions. Consistent with the previous reviews, the Institute of Medicine concluded that regarding exposure therapy, “the evidence is sufficient to conclude the efficacy of exposure therapies in the treatment of PTSD” (p. 8). By contrast, regarding EMDR, cognitive therapy, and coping skills training, the Institute of Medicine concluded that the evidence is “inadequate to determine the efficacy” (p. 9) of these other treatments.

**Innovations**

Among the 64 randomized studies of CBT for PTSD included in the Cahill et al. (2008) review previously discussed are a small number of studies of recent treatment innovations. One such innovation is the specific targeting of nightmares and other sleep disturbances, two common symptoms of PTSD. Little is currently known about the efficacy of the various CBT programs discussed thus far for the resolution of such symptoms (Maher et al. 2006), and at least one study found that nearly half (48%) of patients who no longer met criteria for PTSD following CBT experienced at least some insomnia posttreatment, and 30% of patients reported severe insomnia (Zayfert and DeViva 2004). Imagery rehearsal therapy is a CBT program that combines sleep hygiene and cognitive restructuring with imaginal exposure to the content of a nightmare. However, during imagery rehearsal therapy is a CBT program that combines sleep hygiene and cognitive restructuring with imaginal exposure to the content of a nightmare. However, during the exposure practice, the content of the nightmare is intentionally altered in some way.

Research into this treatment program is just beginning, but the results of two randomized studies are promising. In the first of these, Krakow and colleagues (2001) found that three group–administered sessions resulted in a significant reduction in the number of nightmares, improvement in sleep quality, and a decrease in other symptoms of PTSD. In a second study, Davis and Wright (2007) modified imagery rehearsal therapy to include relaxation training, additional exposure through writing and talking about the nightmares, and education about common trauma–related themes included in CPT. As in the Krakow et al. (2001) study, the modified
imagery rehearsal therapy was superior to wait-list conditions on measures of nightmare frequency, sleep quality, and PTSD. At present, however, there are no studies directly comparing imagery rehearsal therapy with other treatments for PTSD to determine the relative merits of targeting PTSD versus the more narrow focus on sleep and combating nightmares specifically in terms of patient outcome.

Two additional innovations enlist the use of computer technology to administer therapy: virtual reality technology and the use of the Internet to deliver therapy. Virtual reality technology has been developed as a method to implement exposure therapy in the treatment of anxiety disorders. A meta-analysis (Powers and Emmelkamp 2008) found 16 group studies in which virtual reality exposure therapy was compared with a wait-list or some other minimal control condition (11 studies) or in vivo exposure (five studies) in the treatment of phobias (11 studies), panic disorder (two studies), social phobia (two studies), and PTSD (one study). The overall effect size (Cohen’s d) for treatments versus control conditions in these studies was 1.11, and the overall effect size for virtual reality exposure versus in vivo exposure was 0.35 in favor of virtual reality exposure (P = 0.06). In the only controlled study of PTSD and virtual reality exposure therapy, Difede et al. (2007a) conducted a small investigation comparing this therapy to a wait-list control condition in the treatment of PTSD related to the September 11, 2001, terrorist attacks on the World Trade Center. Exposure was conducted according to a hierarchy beginning with images of a jet flying over the Twin Towers but not crashing into them, working gradually to witnessing a full sequence of events that included jets crashing into both towers, people screaming, people jumping from the buildings, and finally both towers collapsing. Completers received between 6 and 13 sessions (mean = 7.5) and demonstrated a significant reduction in PTSD severity scores whereas patients in the wait-list control group had a slight increase in their scores. The post-treatment effect size for completers was large (d = 1.54).

In a related use of technology, Basoglu et al. (2007) provided Turkish earthquake survivors with a single session of exposure to simulated tremors. The earthquake simulator consisted of a small house mounted on a shake plate that could simulate earth tremors of different magnitude, under control of the patient. Length of time in the simulator was permitted to vary and ranged from 9 to 70 minutes. Results indicated significant reductions in PTSD severity measured 4 and 8 weeks after completion of treatment relative to severity in wait-list control subjects over the same time period.

The second innovative approach using computer technology is the use of the Internet to deliver therapy. Lange and his colleagues (2003) have developed a treatment program titled Interapy that is used to conduct all aspects of treatment over the Internet, including initial screening for eligibility, informed consent, baseline assessment, implementation of the treatment, and post-treatment assessment. The treatment involves patients writing 10 essays over a period of 5 weeks. Four essays involve exposure to the trauma, four essays encourage cognitive reappraisal by instructing patients to provide advice to a hypothetical friend who went through the same experience, and the final two essays involve writing a letter of closure addressed either to the self or to some significant other. Seven times throughout the treatment, patients receive written feedback on their essays from a therapist making suggestions as to how to proceed.

Two randomized studies of Interapy have been conducted thus far, the first using a population of undergraduate psychology students reporting traumatic symptoms who received research credit for their participation (Lange et al. 2001). In the second study the treatment was made more broadly available to the residents of Amsterdam (Lange et al. 2003). Both studies found significant reductions in trauma-related reexperiencing and avoidance among treatment completers compared to wait-list control subjects. In a third study, Hirai and Clum (2005) evaluated an 8-week Internet-administered treatment that included anxiety management training (relaxation and controlled breathing), cognitive restructuring, and exposure via writing. Except for a telephone screening to determine eligibility, all assessment measures were completed online or submitted through the mail. Patients were drawn from n=32; all assessment measures were completed online or submitted through the mail. Patients were drawn from psychology students at Virginia Polytechnic Institute and State University who were seeking extra credit and from the larger Blacksburg, Virginia, community. Treatment completers showed greater reductions in PTSD symptoms, anxiety, and depression and increases in coping abilities and self-efficacy than patients assigned to a wait-list condition.

Using the Internet (or postal services) to conduct assessments and administer therapy has important potential advantages, as it makes treatment available to individuals who may not be otherwise willing to seek mental health services due to the perceived stigma, as well as to those who live in areas where mental health services are not otherwise available. However, this is balanced by
concerns raised about providing mental health services to someone sight unseen, including concerns about patient safety, the practice of psychotherapy across state and even international borders, and the accuracy of the information obtained. This final concern is of particular relevance to research evaluating the efficacy of therapy administered via the Internet, as the structured clinical interview administered by a well-trained independent evaluator blinded to the treatment used is considered the industry standard for psychotherapy outcome research.

Litz et al. (2007; see Litz et al. 2004 for greater details of the intervention program) conducted a study that combined live therapy delivered through the Internet and in-person assessment. Patients in the study were active-duty Department of Defense personnel with PTSD resulting from exposure to the September 11, 2001, terrorist attacks on the U.S. Pentagon or from subsequent combat in Iraq or Afghanistan. The 8-week CBT program involved an initial in-person visit with a therapist to complete the pretreatment evaluation, provide psychoeducation in stress management and cognitive reframing techniques, begin the development of a hierarchy of stressful situations, and orient patients to the use of the De-Stress (Litz et al. 2007) Internet program. Thereafter, patients were instructed to log in at least once per day, and the program provided information and instructions about the use of stress management techniques, self-monitoring to identify stressful situations, and graduated in vivo exposure. After week 6 a telephone contact with the therapist was scheduled to assess the patient's readiness to confront the memory of the trauma through writing a trauma narrative and repeatedly reading it. Throughout the study, patients had ad lib access to the information on the Web site and were able to contact their therapist through e-mail and by telephone. Results revealed that treatment completers showed significantly greater reduction in PTSD severity than did those who received supportive counseling similarly administered through the Internet, although no differences were seen in the intent-to-treat analyses.

**Treatment of Acute Stress Reactions/Prevention of Chronic PTSD**

Although studied less extensively, two approaches for preventing chronic posttraumatic psychopathology that have received empirical scrutiny are psychological debriefing and brief CBT (B-CBT) packages.

Following the original ISTSS practice guidelines (Foá et al. 2000), we use the term *psychological debriefing* in a general way to refer to very brief interventions consisting of one or a few sessions), which are usually implemented shortly after the occurrence of a traumatic event (typically within 72 hours) and share a number of features. These shared features comprise discussion of the facts of the traumatic event and the trauma survivors' beliefs about what happened; an opportunity to express thoughts, impressions, and emotional reactions; provision of information to normalize the trauma survivors' reactions; and planning for coping with the trauma and its consequences (Bisson et al. 2000).

Proponents of psychological debriefing (e.g., Everly et al. 2001) have emphasized that psychological debriefing should not be viewed as a stand-alone treatment, but rather should be implemented in the larger context of the more comprehensive Critical Incident Stress Management (CISM) protocol and that psychological debriefing was intended to be implemented as a group intervention rather than an individual intervention. By contrast, the randomized, controlled studies of psychological debriefing have focused primarily on individually administered psychological debriefing implemented as a stand-alone intervention; some studies have utilized groups, but these were not randomized (e.g., Carlier et al. 1998, 2000; Deahl et al. 2000; Eid et al. 2001). To our knowledge, no randomized, controlled studies have been conducted evaluating group psychological debriefing in the context of CISM. With the preceding caveats in mind, the results of randomized, controlled studies of individual psychological debriefing are somewhat mixed, but a potentially important pattern appears to be emerging. Specifically, although participants receiving psychological debriefing in general report high levels of consumer satisfaction with the intervention and studies utilizing valid and reliable measures of PTSD symptoms find improvement over time, studies that included an untreated control condition have not found any benefit on specific PTSD measures (e.g., Conlon et al. 1999; Rose et al. 1999). Thus, symptom reduction following psychological debriefing in these studies is better attributed to natural recovery rather than an effect of treatment. Even more concerning, however, is the possibility of an iatrogenic effect of psychological debriefing, such that the intervention may impede natural recovery among some individuals, such as those with the most severe initial traumatic reactions (e.g., Bisson et al. 1997; Carlier et al. 1998, 2000; Mayou et al. 2000).

A more promising, but as yet still underresearched, approach is the application of brief (4–5 sessions) CBT utilizing the same anxiety management and exposure therapy techniques developed for the treatment of
chronic PTSD. B-CBT is typically initiated 2–4 weeks posttrauma and appears to speed recovery from early PTSD symptoms (Foa et al. 1995a, 2006b) and acute stress disorder, and may reduce the incidence of PTSD 6 months later (Bryant et al. 1998, 1999, 2003b), although long-term (≥1 year) follow-up studies of intent-to-treat samples have found similar rates of PTSD for B-CBT and supportive counseling (Bryant et al. 2003b). Mirroring the research on treatment for chronic PTSD, the only study to directly compare the combination of exposure therapy plus anxiety management training versus exposure therapy alone (Bryant et al. 1999) found no significant differences between the two treatments. In a recent study (Bryant et al. 2008), participants who received exposure therapy improved much more than those receiving cognitive restructuring, whose improvement did not differ from that of wait-list control subjects. It seems that the specific active component in B-CBT is exposure.

One of the major factors limiting progress in the development of highly efficacious prevention programs is the phenomenon of natural recovery. As longitudinal studies of trauma survivors have shown, most individuals exposed to a traumatic event will show a decline in PTSD symptoms in the weeks and months immediately following the traumatic event (e.g., Blanchard et al. 1996; Riggs et al. 1995; Rothbaum et al. 1992). Thus, either efficacious preventative programs must promote more rapid or complete recovery than would occur naturally, or researchers need to be able to reliably identify subpopulations least likely to recover in the absence of intervention, as has been generally true of the diagnostic criteria for acute stress disorder (e.g., Harvey and Bryant 2002). Despite this limitation, the extant research suggests that brief versions (i.e., 4–5 sessions compared to 9 or more sessions) of the same CBT programs that are effective in the treatment of chronic PTSD, when administered starting within a few weeks of the trauma, can speed recovery for some individuals displaying PTSD symptoms.

**Discussion of Factors Affecting Outcome**

In contrast to the large body of literature on the efficacy of various treatments for PTSD, studies examining predictors of treatment outcome are few. The factors that have been investigated as predictors of treatment outcome for CBT may be classified into three types: 1) pretreatment variables, which include trauma-related variables (e.g., type of trauma, prior history of trauma) and personal characteristics (e.g., anger reactions); 2) general treatment-related factors, such as treatment attendance; and 3) specific treatment-related factors, such as fear activation during exposure therapy exercises followed by subsequent fear reduction. The potential utility of identifying pretreatment predictors of treatment outcome is to provide individuals with accurate expectations about the efficacy of treatment and, in cases where different treatments are found more or less effective for certain kinds of individuals, to match patients with the most effective treatments. By contrast, the potential utility of identifying treatment-related predictors of outcome is to provide therapists with guidance as to which factors to focus on in sessions in order to optimize treatment outcome.

Among the pretreatment predictors of treatment outcome, some studies found that initial PTSD severity was associated with poor outcome (Blanchard et al. 2003b; van Minnen et al. 2002). However, as noted below, Foa and Cahill (2002) found PTSD severity to predict poor outcome with SIT but not with prolonged exposure. To the extent that high severity impedes improvement with some treatments, this may reflect in part an artifact that is related to the practice in most randomized, controlled studies of providing a single dose of treatment regardless of patient response to treatment. Specifically, even when there are no differences in the rate of improvement between individuals with different initial PTSD severity levels, those with higher PTSD levels pretreatment will also have higher levels posttreatment unless the dose of treatment selected is enough for optimal outcome among those with the highest pretreatment levels. For this reason, what is important is to identify predictors of change from pre- to posttreatment or predictors of posttreatment PTSD severity after controlling for pretreatment severity. Trauma-related characteristics that have been associated with poorer outcome include the following:

- A history of childhood trauma prior to the index event (Hembree et al. 2004a; van Minnen et al. 2002)
- Multiple traumas or a personal trauma (e.g., interpersonal assault), as opposed to impersonal trauma (e.g., natural disaster) (van Minnen et al. 2002)
- Time since the trauma (van Minnen et al. 2002)
- The receipt of injury during the trauma (Hembree et al. 2004a)
Pretreatment patient characteristics that have been associated with poorer response to treatment include the following:

- Male gender (Tarrier et al. 2000)
- Suicide risk (as judged by the therapist) (Tarrier et al. 2000)
- Living alone (Tarrier et al. 2000)
- Comorbid GAD (Tarrier et al. 2000) and depression (Taylor et al. 2001)
- Pain severity and interference due to the trauma (Taylor et al. 2001) as well as days of work missed (Blanchard et al. 2003b)
- Pretreatment anger problems (Foa et al. 1995c; Taylor et al. 2001; van Minnen et al. 2002)
- The use or increased use of psychiatric medication during the treatment period (Taylor et al. 2001), particularly benzodiazepine use (van Minnen et al. 2002)

Interestingly, several of the factors that have been associated with poorer treatment outcome (e.g., multiple traumas or trauma prior to the index trauma) have also been found to be associated with development of chronic PTSD (for meta-analytic reviews of factors related to the development of chronic PTSD, see Brewin et al. 2000 and Ozer et al. 2003).

Although several trauma and patient characteristics have been identified as predictors of treatment outcome, few have been studied across a range of samples to evaluate their reliability. Indeed, some factors that have been studied in multiple samples fail to replicate as predictors of outcome. For example, whereas Hembree et al. (2004a) and van Minnen et al. (2002) found that prior history of childhood trauma was associated with poorer treatment outcome, Resick and colleagues (2003) did not find any difference in treatment response between rape victims with and those without a prior poorer treatment outcome, Resick and colleagues (2003) did not find any difference in treatment response between rape victims with and those without a prior history of childhood sexual abuse. Pretreatment anger variables have been associated with poorer outcome in several studies (Foa et al. 1995c; Taylor et al. 2001; van Minnen et al. 2002); however, Cabhill et al. (2003) found not only that pretreatment anger was associated with poor outcome but also that CBT for PTSD significantly reduced anger, even among patients with clinically elevated anger levels at pretreatment. Similarly, although comorbidity with depression (Taylor et al. 2001) and GAD (Tarrier et al. 2000) has been associated with poorer response to treatment in some studies, CBT for PTSD has been found to reduce the prevalence of these conditions (Blanchard et al. 2003a).

In an attempt to answer the question of matching treatments to patients, Foa and Cahill (2002) examined differential predictors for outcome of prolonged exposure and SIT. They found that a greater level of general anxiety prior to treatment was associated with more severe PTSD symptoms posttreatment. However, high pretreatment severity of PTSD, depression, and poor social functioning were not related to treatment outcome of prolonged exposure. In contrast, poorer general social functioning at pretreatment predicted poorer social functioning and greater depression after treatment with SIT. Also, greater levels of pretreatment PTSD and depression predicted greater PTSD severity following treatment with SIT. These findings suggest that prolonged exposure may be more suitable for patients who initially present with poor social functioning, severe PTSD, or severe depression.

General treatment-related variables that were found to be associated with poorer outcome were the following:

- Patient ratings of low credibility of treatment, therapist ratings of low patient motivation for treatment, a great number of missed sessions (Tarrier et al. 1999), or patients requiring a longer period of time to complete treatment (Tarrier et al. 2000)
- Low patient engagement or high avoidance in therapy (Taylor et al. 2001)
- Less completed homework (Marks et al. 1998)
- A poor working alliance during the early portion of therapy (Cloitre et al. 2004)

Interestingly, Cloitre et al. (2004) found that the effect of the working alliance on outcome was mediated through its effect on increased negative mood regulation. Specifically, a strong working alliance early in therapy was associated with greater regulation of negative mood during subsequent sessions, which in turn was associated with greater symptom improvement. Consistent with mediation, the direct relationship between the working alliance and treatment outcome was no longer significant after taking into consideration the effect of negative mood regulation on treatment outcome (Baron and Kenny 1986).

Lastly, several studies have investigated specific treatment-related factors that according to Foa and Kozak's (1986) emotional processing theory are expected to be associated with better outcome in the treatment of PTSD. According to emotional processing theory, anxiety, such as is seen in PTSD, reflects the activation of a fear structure encoded in memory that contains infor-
mation about fear-relevant stimuli and responses, as well as the meanings attributed to these stimuli and responses. Fear is pathological when the fear structure contains erroneous associations such that harmless stimuli are associated with the meaning of “danger” and trigger intense fear and avoidance reactions. Fear reduction requires modification of the fear structure through activation of the fear structure and the incorporation of corrective information. Foa and Kozak (1986) suggested three indicators for emotional processing (i.e., modification of the fear memory in ways to promote fear reduction): 1) fear activation, indicating the fear network has been accessed, 2) within-session fear reduction, and 3) between-session fear reduction (i.e., habituation), which may serve as part of the corrective information (e.g., evidence that arousal does not last indefinitely) as well as be indicative of change in the underlying fear structure. Consistent with emotional processing theory, studies have found evidence that outcome of exposure therapy is associated with the following:

- Activation of fear during exposure (Foa et al. 1995c; Jaycox et al. 1998; Pitman et al. 1996b)
- Habituation of fear within exposure sessions (Pitman et al. 1996b)
- Habituation across sessions (Jaycox et al. 1998; Pitman et al. 1996b)

Also consistent with the tenets of emotional processing theory, and consistent with other cognitive theories of PTSD (e.g., Ehlers and Clark 2000), is evidence of cognitive change following treatment for PTSD (e.g., Foa and Rauch 2004) and evidence that improvement following treatment is associated with changes in the trauma narrative such that reduced fragmentation in the narrative is associated with reduced anxiety and increased organization is associated with reduced depression (Foa et al. 1995b).

As noted earlier, most randomized, controlled treatment outcome studies select a single arbitrary dose of treatment. Yet it is possible that some individuals may require more treatment than others to obtain a good outcome. Thus, one strategy for improving outcomes is to provide the same treatment for longer duration, as is commonly done in clinical practice: when a patient is showing improvement but has not yet fully responded to treatment, sometimes the most sensible approach is to continue with more of the same. Foa et al. (2005) incorporated such flexible dosing. Patients whose PTSD symptoms decreased by at least 70% at session 8 termin-
nated treatment at session 9. The remaining patients were offered additional sessions, to a maximum of 12. Fifty-eight percent of patients received extension sessions; these patients had showed an average reduction of PTSD severity of 31% by session 8. Further improvement was achieved during the extension period, such that after the extension sessions the average reduction in PTSD severity from pretreatment was 60%. Thus, research is beginning to address the need to develop and evaluate strategies for enhancing treatment outcome for those who show partial response to existing treatment programs, but further research is needed.

Other Psychosocial Approaches

Psychodynamic Therapy

Psychodynamic treatment attempts to reengage normal mechanisms for adaptive behavior by bringing unconscious conflicts into the conscious mind. This is done by investigating the psychological meaning of the traumatic event with the patient. It may include the exploration of wishes, fears, and defense mechanisms evoked by the event, and the relationship between the patient and therapist is considered a key element in the treatment (Kudler et al. 2000). In a study of prototypical community treatments for PTSD, Schottenbauer et al. (2006) identified several key factors that define psychodynamic treatment:

1. One factor consists of items that would be classified as expressive therapy. Expressive therapy aims to increase insight and self-knowledge, using the techniques of questioning, confrontation, clarification, and interpretation (Wallerstein and Dewitt 1997). The therapist takes a neutral position toward the patient, and the therapeutic relationship itself is a refuge. The therapist takes a neutral position toward the patient, and the therapeutic relationship itself is a mechanism for treatment, as well as the interpretation of transference. Expressive techniques deemed most important by therapists included the patient’s feeling anxiety and having a discomforting affect, the therapist conveying a sense of nonjudgmental acceptance, and the therapist asking for more information.

2. Another psychodynamic factor corresponds to what has been termed supportive therapy in the psychodynamic tradition, an approach that reduces mental anguish and attempts to strengthen defenses to increase the adaptation of the ego in daily life (Wallerstein and Dewitt 1997). Supportive psychotherapy also aims to help the patient develop more
effective defense mechanisms. Not unlike CBT clinicians, psychodynamic therapists administering supportive therapy may intervene with regard to the patient’s daily life. The therapist may suggest specific activities to do between sessions, giving explicit advice and providing guidance as needed, although this was considered a less important aspect of treatment in the Schottenbauer et al. (2006) study.

3. A third factor, termed psychodynamic-integrative, includes components such as challenging the patient’s views, encouraging action, focusing on feelings of guilt, and emphasizing emotional experiences.

Although individual psychodynamic treatment is offered widely by professionals for PTSD (Becker et al. 2004), only one randomized, controlled trial has included a psychodynamic component for PTSD (Brom et al. 1989), so this modality has not yet been established as an empirically supported treatment for trauma.

**Group Therapies**

Group therapy has been frequently prescribed for both acutely and chronically traumatized individuals. It has been used to treat trauma following assault (Mitchell 1983), natural disaster (Lystad 1988; Raphael 1986), childhood sexual abuse (Ganzarian and Buchele 1993; Herman and Schatzow 1987), rape (Yassen and Glass 1984), domestic violence (Rounsaville et al. 1979), concentration camp internment (Laub and Auerhahn 1993), and war (Parson 1985). The task of group therapy is to help victims regain a sense of safety, connection, and competence. Sharing one’s experience with other victims may be considered an effective intervention because the shared history of trauma can form the basis of solidarity in a community of experiencing individuals because the shared history of trauma can form the basis of reestablishing a sense of community in individuals who may feel cut off from others. For chronically traumatized individuals, group psychotherapy may provide a sense of mutuality and a forum to explore concerns about safety and trust that have been affected by the trauma (van der Kolk et al. 2002).

There are three primary types of group therapies, which can be broadly classified as supportive, psychodynamic, and cognitive-behavioral, although some treatments may use a blend of approaches. Although the approaches may differ in their underlying formulations of symptom etiology and maintenance, they share many similar features including the following:

- Membership in the group by survivors of the same type of trauma (e.g., combat veterans, rape victims)
- Validation of the traumatic exposure
- Normalization of traumatic responses
- Adoption of a nonjudgmental stance toward the patient’s response to the trauma

Incorporating these principles facilitates the development of a safe therapeutic environment.

Since the establishment of PTSD as a separate diagnosis in DSM, relatively little research has focused on the evaluation of group therapy techniques. Only a handful of group psychotherapy outcome studies have been published since the late 1990s, eight of which were studies of CBT (J. G. Beck et al. 2009; Falsetti et al. 2001, 2005; Hollifield et al. 2007; Krakow et al. 2000, 2001; Schnurr et al. 2003; Zlotnick et al. 1997), two on psychodynamic therapy (Classen et al. 2001; Spiegel et al. 2004), and one using an insight-oriented feminist model (Stalker and Fry 1999). Other studies have been nonrandomized or lacked a control condition, which limits the conclusions that can be drawn. Importantly, most randomized, controlled studies failed to account for clustering observations within groups, which limits the power of these studies to draw clear conclusions about the efficacy of treatment.

Other than the fact that most group studies demonstrate some positive benefit for participants, little is known about the factors that moderate or mediate outcome for a PTSD therapy group of any type. Neither of the two studies that compared group CBT to an active comparison condition found any advantage for one treatment over the other. In a study of 325 male veterans, Schnurr et al. (2003) did not find any advantage for the trauma-focused CBT condition compared to present-focused supportive group therapy (Schnurr et al. 2003). For the trauma-focused CBT condition compared to present-focused supportive group therapy (Schnurr et al. 2003). In a much smaller study of 84 men and women with PTSD resulting from a variety of civilian traumas, Hollifield et al. (2007) found that both group CBT and individually administered acupuncture were superior to a wait-list control condition but that there were no differences between the two treatments. There is also evidence that the presence of a borderline member in a group hampers recovery among all members (Cloitre and Koenen 2001). Research on group therapy as a means of delivering PTSD treatment is still in the early stages, and more research is needed before it can be considered an empirically validated modality. In particular, there is a need to compare the same treatment delivered in group versus individual sessions to determine
whether changing the format changes the efficacy of treatment.

Special Populations

CBT has been used successfully in controlled studies to relieve the symptoms of PTSD in the following groups:

- Adult female survivors of rape (e.g., Echeburua et al. 1997; Foa et al. 1991, 1999, 2005; Resick et al. 2002, 2008; Rothbaum et al. 2005), physical assault (e.g., Foa et al. 1999, 2005; Resick et al. 2008), domestic violence (Kubany et al. 2003, 2004), and childhood abuse (e.g., Chard 2005; Cloitre et al. 2002; Foa et al. 2005; Resick et al. 2008)
- Male and female veterans (e.g., Cooper and Clum 1999; Glynn et al. 1999; Keane et al. 1989; Monson et al. 2006; Schnurr et al. 2007)
- Motor vehicle accident victims (e.g., Blanchard et al. 2003a; Ehlers et al. 2003; Fecteau and Nicki 1999)
- Refugees (e.g., Neuner et al. 2004; Otto et al. 2003; Paunovic and Ost 2001)
- Earthquake victims (Basoglu et al. 2005, 2007)
- Emergency responders (e.g., Difede et al. 2007b)
- Victims of terrorism (Difede et al. 2007a; Duffy et al. 2007)
- Mixed accident and assault victims (e.g., Bryant et al. 2003a; Ehlers et al. 2005; Marks et al. 1998)

Additional groups have been studied in open trials and in some randomized trials of CBT, with promising results. These samples included men and women receiving treatment for PTSD comorbid with the following conditions:

- Cocaine dependence (Back et al. 2001; Brady et al. 2001)
- Cocaine dependence (Back et al. 2001; Brady et al. 2001)
- Other substance use disorders (Najavits et al. 2005, 2006)
- Traumatic grief (K. Shear et al. 2005; M. K. Shear et al. 2001)
- Severe mental illness, such as bipolar disorder (Mueser et al. 2007, 2008)

Patients with PTSD and other comorbid disorders may also benefit from CBT, as treatments that reduce PTSD symptoms also reduce symptoms of general anxiety and depression. Studies have found that CBT treatment for PTSD decreases anger (e.g., Cahill et al. 2003), trauma-related guilt (Kubany et al. 2003; Resick et al. 2002), and shame (Kubany et al. 2003). Simultaneously, it increases self-esteem (Kubany et al. 2003) and reduces maladaptive trauma-related cognitions (Foa and Rauch 2004; Paunovic and Ost 2001). Cloitre et al. (2002) implemented a treatment for PTSD from childhood abuse that combined skills training in affect regulation and interpersonal relationships followed by imaginal exposure. Although improvement at post-treatment was associated with the strength of the therapeutic alliance developed during the skills training phase of treatment, within-group effect sizes for the exposure therapy phase of treatment were as large as or larger than the corresponding effect sizes for the skills training phase on measures of dissociation, alexithymia, and depression (Cahill et al. 2004b).

Certain comorbid conditions may reduce the effectiveness of CBT for PTSD. As noted previously, Tarrier et al. (2000) and Taylor et al. (2001) found that the presence of comorbid GAD predicted poorer outcomes, although Blanchard et al. (2003a) found that CBT for PTSD resulted in significant reductions in comorbid and major depression compared to either supportive counseling or a wait-list condition. Feeny et al. (2002) reanalyzed data from the Foa et al. (1999) study of prolonged exposure, SIT, and prolonged exposure/SIT to investigate whether treatment for PTSD would be less efficacious in patients with borderline personality characteristics. Results revealed no significant differences among treatment completers in their response to measures of PTSD severity, depression, or state- or trait-anxiety. In an analysis of data from the Foa et al. (2005) study of prolonged exposure alone and in combination with cognitive restructuring, Hembree et al. (2004a) found no difference in the percentage of patients who no longer met diagnostic criteria following treatment between participants with and without personality disorders who met diagnostic criteria following treatment between participants with and without personality disorders.

Falsetti et al. (2001, 2005) evaluated the efficacy of a treatment called multichannel exposure therapy (M-CET) that combined Resick and Schnicke's (1992) CPT program with parts of Barlow and colleagues' (1994) panic control treatment for the treatment of women with PTSD and comorbid panic attacks. Compared to a wait-list control condition, treatment with M-CET resulted in a significant decrease in both PTSD severity and panic frequency. Hinton and colleagues (2005b, 2006a) have studied a combination CBT treatment that also incorporates elements of panic control treatment for use in the treatment of Cambodian and Vietnamese refugees with PTSD, who also frequently reported physical symptoms similar to those
of panic. Results of three small randomized, controlled studies (Hinton et al. 2004, 2005a, 2006b) have found the treatment to be associated with superior outcome compared with wait-list control conditions on measures of both PTSD severity and anxiety sensitivity, the latter being a cognitive vulnerability factor associated with panic disorder (Taylor 1999).

In summary, CBT for PTSD has been found to be efficacious across a range of study populations, including populations with a range of specific traumas and individuals with a range of comorbid conditions. Successful treatment of PTSD is frequently associated with improvement using many different types of outcome measures and with a reduction in some common comorbid conditions. In addition, CBT for PTSD has been successfully integrated with CBT treatments for other specific comorbid conditions, although no dismantling or comparative outcome studies have been published to determine whether the addition of other CBT elements targeting the comorbid condition is necessary to achieve optimal outcome.

**Practical Techniques**

**Treatment of PTSD**

At the Center for the Treatment and Study of Anxiety, we have been studying interventions for the prevention (Foa et al. 1995a, 2006b) and treatment of PTSD since the mid-1980s (Foa et al. 1991, 1999, 2005; Rothbaum et al. 2006). Although there are many effective treatment options for people with PTSD, at present we believe the evidence favors prolonged exposure—the combination of imaginal and in vivo exposure therapy—as the treatment of choice, for four primary reasons (Cahill and Foa 2004):

1. The efficacy of exposure therapy has been repeatedly demonstrated in randomized, controlled trials across a wide range of trauma populations by researchers in the United States and internationally.
2. Prolonged exposure is the only treatment that has been directly compared with each of the other major treatments (i.e., SIT, variations of cognitive therapy, and EMDR); these studies have generally found that prolonged exposure produces outcomes that are as good as or somewhat better than outcomes with the comparison treatments.
3. Attempts to enhance the efficacy of prolonged exposure by adding elements of other CBT programs, such as SIT or cognitive therapy, have not resulted in a demonstrably better outcome than prolonged exposure alone.
4. The results of our initial work evaluating the efficacy of prolonged exposure when administered by community therapists have been quite successful (Foa et al. 2005; Schnur et al. 2007).

No other treatment program has yet established as complete and successful a track record as prolonged exposure. Therefore, this section is devoted to the treatment of PTSD with prolonged exposure.

Prolonged exposure is typically administered in 9–12 ninety-minute sessions delivered once or twice weekly. The two primary techniques employed in the administration of prolonged exposure are imaginal exposure to the traumatic memory, where the patient is helped to mentally visualize the feared traumatic memory and recount it aloud, and in vivo exposure to traumatic reminders and safe stimuli (people, places, things, or activities) that trigger trauma-related distress in daily life. Typically, the techniques are used in combination.

In the first therapy session, following a thorough intake evaluation to determine that PTSD symptoms are the patient's primary psychological difficulties, the therapist obtains further information about the patient's trauma history and begins the process of psychoeducation. The first two sessions consist of education about the nature of trauma, which includes common reactions to trauma, factors that maintain PTSD symptoms, and the rationale for treatment by prolonged exposure. Together, the therapist and patient agree on the details of the treatment plan (e.g., creating a hierarchy of feared objects and situations for in vivo practice), and the patient receives training in controlled breathing. Importantly, controlled breathing is presented as a method to manage stress in the course of daily life, not as a method to control breathing during in vivo exposure. Importantly, controlled breathing is presented as a method to manage stress in the course of daily life, not as a method to control anxiety during exposure exercises. In vivo exposure is discussed in depth in the second session, and the first in vivo exposure homework assignment is assigned for the patient to implement between the second and third sessions. To monitor progress, the patient is taught to quantify the level of distress or anxiety at the beginning, peak, and end of each in vivo exercise using the Common Subjective Units of Distress Scale (described in Foa et al. 2007) that ranges from 0 (no anxiety/distress) to 100 (most anxiety/distress ever).

During sessions 3 through 5, imaginal exposures are conducted with the therapist, and the patient describes the entire traumatic memory from beginning to end. Patients are instructed to close their eyes, imagine the trau-
mantic event as vividly as possible, and describe it out loud in detail, including a description of the thoughts and emotions they experienced during trauma. The patient is instructed to describe the traumatic event in the present tense and is encouraged to become emotionally engaged with the memory. The therapist asks the patient to report his or her Subjective Units of Distress levels approximately every 5 minutes during the imaginal exposure. The exposure is conducted for 30–60 minutes and is audiorecorded each time for the patient to listen to as part of daily homework. At the end of each imaginal exposure session, the therapist and patient spend about 20 minutes discussing the patient’s experience during the imaginal revisiting of the trauma. Often the patient will report new details and insights about the trauma during the discussion. This phase of the session, called processing, helps patients to integrate the new information and insights into their understanding of the event. In this way, prolonged exposure reduces the distress associated with the unpleasant memories and ultimately results in a more realistic perspective about the experience.

By the fifth or sixth session, the focus of the imaginal exposure is shifted to specific segments within the traumatic narrative. By this point in therapy, patients are generally able to recount the trauma more easily, but there are usually a few specific parts of the story that are more upsetting than the rest, which we refer to as hot spots. Imaginal exposure is then focused on repeating the parts of the story that constitute these hot spots, one at a time, until anxiety to the hot spot diminishes. In the final session, the patient puts the whole story back together again and narrates the trauma from beginning to end. A more detailed description of the treatment can be found in Foa et al. (2007).

Clinical Issues

Clinical Issues

Use of Exposure in Clinical Practice

Effective treatments for PTSD, such as prolonged exposure and other forms of CBT, cannot benefit traumatized patients unless mental health care providers make use of the treatments. Evidence suggests that given an informed choice, consumers would select exposure or another form of CBT as their most preferred treatment for PTSD (Becker et al. 2007; Zoellner et al. 2003). However, many consumers of mental health services are unaware that different types of therapy exist and that some treatments have greater evidence of efficacy than others. They may rely on their therapists to determine what treatment is appropriate for their needs. Unfortu-
cantly from each other in dropout rates: 20.5% with exposure therapy alone, 22.1% with SIT or cognitive therapy alone, and 26.9% with exposure therapy plus SIT or cognitive therapy alone. The only exception was EMDR, with a dropout rate of 18.9%, which did not differ significantly from the dropout rates in either control groups or active treatment groups. Thus, although dropout rates were higher in active treatment groups than in control groups, dropout rates with exposure therapy alone were no different than those with other active treatments.

A second concern is that exposure therapy may actually worsen symptoms of PTSD. Two reports that have advanced this idea are a case series by Pitman et al. (1991) and a randomized study by Tarrier et al. (1999). Pitman et al. (1991) described six cases taken from a larger study (N=20; Pitman et al. 1996b) of imaginal exposure therapy with veterans. Although each of the cases described some form of worsening of symptoms (e.g., increased trauma or depressive symptoms, or relapse of a preexisting condition such as alcohol abuse), the study from which the cases came did not include a comparison condition. Thus, it is not known how patients would have fared with no treatment at all.

Tarrier et al. (1999) examined the relative rates of numerical symptom worsening following treatment with either imaginal exposure or cognitive therapy (N=72). Numerical symptom worsening was defined as an increase from pre- to posttreatment of at least one point on the Clinician-Administered PTSD Scale (CAPS; Blake et al. 1995). Despite comparable overall improvement in the two conditions across several outcome measures, 9% of patients receiving cognitive therapy reported numerical worsening compared with 31% of those receiving exposure therapy. The interpretation of this finding, however, is limited by three considerations. First, an increase of one point on the CAPS is of those receiving exposure therapy. The interpretation of this finding, however, is limited by three considerations. First, an increase of one point on the CAPS is within the measurement error of the instrument (Devilly and Foa 2001); therefore it is not clear whether these patients’ symptoms actually got worse or simply did not improve. Second, as in the Pitman et al. (1991) study, Tarrier et al. (1999) did not include a no-treatment control condition. Thus, it is not clear how their finding compares with the natural course of the disorder. Third, the high rate of relative numerical worsening seen in Tarrier et al.’s (1999) exposure therapy condition has not been replicated.

Taylor et al. (2003) evaluated rates of numerical symptom worsening following exposure therapy, EMDR, and relaxation therapy. Of 45 participants who completed treatment, only one patient showed numerical symptom worsening on the CAPS, and that patient received relaxation therapy. Unpublished analyses of numerical symptom worsening among completers from studies by Foa et al. (1999, 2005), Resick et al. (2002), and Rothbaum et al. (2005) also found low rates of PTSD numerical symptom worsening following prolonged exposure (<10%), which were not different from rates seen with other CBT treatments and were significantly lower than rates of symptom worsening with no-treatment control conditions (Cahill et al. 2004a), Cloitre et al. (2002) investigated the efficacy of a PTSD treatment for childhood abuse (N=58) that combined imaginal exposure with skills training in interpersonal relationships and affect regulation, based on principles of dialectical behavior therapy (Linehan 1993). Approximately 5% of patients receiving the treatment showed numerical symptom worsening compared with approximately 25% of patients assigned to a wait-list condition. Thus, the evidence suggests that treatment reduces the likelihood of symptom worsening and that rates of numerical symptom worsening are not higher following exposure therapy than following other treatments.

Foa et al. (2002) evaluated whether reliable symptom worsening, an increase larger than the standard error of the difference between two measurement occasions (Devilly and Foa 2001), was associated with the initiation of imaginal exposure, increased dropout from treatment, or poorer treatment outcome. Utilizing data from the Foa et al. (2005) study comparing prolonged exposure versus prolonged exposure plus cognitive restructuring (prolonged exposure/CR), Foa et al. (2002) examined reliable symptom increases in self-reported PTSD severity occurring between sessions 2 and 4. Patients assigned to the prolonged exposure condition began imaginal exposure in session 3, whereas patients assigned to prolonged exposure/CR learned cognitive restructuring signed to the prolonged exposure condition began imaginal exposure in session 3, whereas patients assigned to prolonged exposure/CR learned cognitive restructuring in session 3, with imaginal exposure starting at session 4. This design allowed comparison of those patients showing symptom increases between sessions 2 and 4 with patients randomly assigned to either begin imaginal exposure or begin cognitive restructuring. A minority of patients (7 of 73; 9.6%) displayed reliable imaginal symptom worsening between sessions 2 and 4, although a greater percentage of such cases occurred after initiation of imaginal exposure (6 of 7, 85.7%) than cognitive restructuring (1 of 7; 14.3%). This phenomenon, if observed in clinical practice, might lead a concerned clinician to abandon imaginal exposure in favor of another technique. However, the prudent approach would be to continue treatment in the same manner, as the increase
in PTSD symptoms is only temporary. Foa et al.'s study (2002) showed that this short-lived symptom worsening was associated with neither poorer treatment outcome nor increased dropout rates.

**Conclusion**

It has been widely recognized that traumatic events can lead to psychological disturbances and chronic distress. Popular therapeutic approaches, such as psychodynamic therapy and group therapy, are not yet considered empirically supported treatments due to the lack of randomized, controlled trials documenting their efficacy. There are at least four treatment approaches that have empirical support for PTSD, all forms of CBT; these include exposure therapy, cognitive therapy, SIT, and EMDR.

CBT has been shown to significantly reduce symptoms of PTSD from a wide variety of traumas, including combat, natural disasters, sexual assault, nonsexual physical assault, childhood abuse, and a combination of traumas. Prolonged exposure, a specific CBT exposure therapy program, is currently the best-supported approach to treatment. Concerns about this approach linger, despite evidence of safety and tolerability comparable to that of other forms of CBT. Prolonged exposure is a relatively short-term treatment that can be administered effectively by clinicians who have limited experience with CBT. An important challenge at the present time is disseminating information about effective treatment programs to therapists, patients, and the general public.

**Key Clinical Points**

- Chronic psychological disturbances following traumatic experiences are a common occurrence that frequently requires therapeutic intervention.
- Psychological debriefing, a frequently proposed early intervention, has not been demonstrated to be more effective than natural recovery or compassionate assessment.
- Cognitive-behavioral techniques have been demonstrated to significantly reduce symptoms of chronic posttraumatic stress disorder and may promote more rapid recovery following trauma.
- Prolonged exposure is a highly effective CBT-based method of reducing PTSD symptoms.
- Most clinicians do not use imaginal exposure with their PTSD patients.
- Exposure therapy is not associated with a worsening of symptoms or early dropout from treatment.
- Psychodynamic and group therapies are common treatments for PTSD but are not yet empirically validated.

not yet empirically validated.

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**Recommended Readings**