Chapter 19

TREATMENT OF DEPLOYMENT-RELATED POSTTRAUMATIC STRESS DISORDER

JOSEF I. RUZEK, PhD*; JEFFREY S. YARVIS, PhD†; and STEVEN LINDLEY, MD, PhD‡

*Director, Dissemination and Training Division, National Center for Posttraumatic Stress Disorder, Veterans Affairs Palo Alto Health Care System, 795 Willow Road, Menlo Park, California 94025

†Lieutenant Colonel, Medical Service Corps, US Army; Chief, Behavioral Health, Department of Psychiatry, Borden Pavilion, Walter Reed Army Medical Center, 6900 Georgia Avenue NW, Washington DC 20307; formerly, Director of Social Work, Uniformed Services University of the Health Sciences, Bethesda, Maryland

‡Director of Outpatient Mental Health, Department of Veterans Affairs Palo Alto Health Care System, 795 Willow Road, 116R/MHC, Menlo Park, California 94025; and Associate Professor, Department of Psychiatry, Stanford University, Palo Alto, California

INTRODUCTION

Posttraumatic stress disorder (PTSD) is the most common and conspicuous psychiatric problem associated with the stress experienced by soldiers in combat. By definition, diagnosis of PTSD requires exposure to a traumatic event that involves experiencing, witnessing, or being confronted by death or serious injury to self or others; a response of intense fear, helplessness, or horror; and development of a set of symptoms that persist for at least a month and cause significant impairment of functioning.[1] Some factor analytic studies have demonstrated four basic dimensions of PTSD symptoms[2]—(1) reexperiencing (nightmares, flashbacks), (2) avoidance (efforts to avoid thinking about the trauma), (3) numbing of general responsiveness (restricted range of affect), and (4) hyperarousal (exaggerated startle response)—but some suggest other complex relationships between symptoms.[3]

Most individuals who develop chronic PTSD experience immediate distress that then persists over time.[4] However, a small, but significant, number of individuals report increases in PTSD symptoms over time (delayed onset PTSD[5]). In retrospective studies of the course of PTSD, three different patterns have been identified: (1) high levels of symptoms after the war followed by recovery, (2) chronic symptoms persisting until the time of the assessment, or (3) relapsing-remitting symptoms.[6] Heterogeneity, of course, was also observed in a longitudinal study of a large community sample of Vietnam veterans. Koenen et al[7] found that only 5.3% of veterans met PTSD criteria in both 1984 and 1998, whereas 6.5% and 5.2% met criteria in 1984 and 1998, respectively.

Current data suggest that approximately 5% to 20% of armed forces personnel deployed for combat, peacekeeping, or humanitarian disaster relief will develop PTSD following their tour of duty.[8–12] Among Vietnam veterans, as reported in the National Vietnam Veteran Readjustment Study,[13] the lifetime prevalence for full PTSD was 30.9% for male veterans and 26% for female veterans. At the time of that study, 15.2% were currently suffering from PTSD. Reanalysis of the survey data, applying criteria revised to reflect changes in diagnostic criteria, indicates that 18.7% of the veterans had developed war-related PTSD during their lifetimes and 9.1% were currently suffering from PTSD 11 to 12 years after the war.[9] Despite the impact of methodology and deployment experiences on exact estimates of symptomatology, these findings represent significant rates of distress that often persist over long periods of time[14] and reflect a significant public health problem.

In considering the problem of PTSD, it should also be acknowledged that problematic reactions to trauma are not limited to full-blown disorder. A considerable percentage (ie, 10%–25%) of those not meeting threshold diagnostic criteria for PTSD experience significant subsyndromal symptoms[15] that may require treatment. Subthreshold, or partial, PTSD is associated with significant levels of impairment of social, occupational, and family functioning,[15–19] often similar to those reported in individuals with full PTSD. (Yarvis et al[18] conservatively defined subthreshold PTSD as having met the *Diagnostic and Statistical Manual*, 4th edition, criteria for the re-experiencing cluster *and* at least one other symptom cluster). Subthreshold presentations of PTSD are also associated with rates of help-seeking behaviors similar to those found with individuals who meet all the diagnostic criteria.[16,20,21] These findings raise questions about the clinical significance of subthreshold PTSD and the diagnostic cutoffs. Those being diagnosed with PTSD may fall on the upper end of a stress-response continuum instead of representing a discrete clinical syndrome.[22]

Individuals diagnosed with PTSD almost always experience additional concurrent mental health disorders, such as substance use disorder, other anxiety disorders, and major depressive disorder.[13,23–25] In the National Comorbidity Survey,[25] 88% of men and 79% of women with a lifetime history of PTSD met criteria for at least one other disorder. PTSD is also associated with significant levels of functional impairment and disability in civilian and veteran populations.[10,11,20,26–37] The extent and number of symptoms can often predict physical and mental health problems.[38] The persistence of PTSD as much as 30 years after trauma exposure is associated with continuing family problems and reduced happiness and life satisfaction.[39]

Risk factors for development of PTSD include characteristics of the traumatic event itself, pretrauma factors, and posttrauma factors. Event characteristics that increase the risk for chronic PTSD include type of trauma, greater amount of exposure, injury, involvement in atrocities, and perceived life threat.[13,40–43] Degree of exposure to potentially traumatic combat events during deployment is strongly associated with development of PTSD.[44] Military sexual trauma is more strongly associated with PTSD than premilitary or postmilitary sexual trauma[45] or other traumas.[46] In a sample of female veterans seeking treatment for stress disorders, sexual stress was found to be almost four times as influential in the development of PTSD as duty-related stress.[47] In veterans, predisposing factors

have included non-Caucasian ethnicity, lower intelligence or education, younger age at exposure, lower socioeconomic status, family problems in childhood, pretrauma psychopathology, and childhood behavior problems.[13,40,41,48] Postevent factors that predict chronic PTSD in veterans include low levels of social support, negative homecoming experiences, poor coping, and adverse life events posttrauma.[40,41,48,49] Although many risk factors exert a similar effect in military and civilian populations, trauma severity and posttrauma social support may be more important in military than in civilian samples.[50]

PSYCHOLOGICAL THEORIES OF POSTTRAUMATIC STRESS DISORDER AND TREATMENT

Conceptions of the etiology of PTSD, both psychosocial and biological, have implications for the understanding of treatment. Many theories have focused on the intense fear often experienced during traumatic events and the impact of fear on conditioned emotional reactions and encoding of traumatic memories. According to emotional processing theory as applied to PTSD,[51] impaired "emotional processing" of traumatic experiences can result in creation of memories of the trauma ("pathological fear structures") that are disruptively intense, contain unrealistic elements (in which harmless stimuli are associated with escape or avoidance responses), and include erroneous evaluations or interpretations (eg, "anxiety will persist until escape" or "fear will cause harm"). The Ehlers and Clark[52] Cognitive Theory of PTSD is similar to emotion-processing theory in drawing attention to the nature of trauma memories (and their links to other memories), to appraisals of the trauma and its sequelae, and to the behavioral and cognitive responses that prevent cognitive change and therefore maintain the disorder.[52]

Foa and Kozak[51] suggest that there are two conditions for change in these problematic fear-related memories once they have been created: (1) the fear structure must be activated, and (2) there must be an incorporation of new information into the memory. Memory activation alone is insufficient for change. In fact, trauma memories are frequently activated by nightmares, conversations, or trauma reminders without benefit to the survivor. These experiences often increase fear for the person, or prompt maladaptive escape or avoidance behaviors. Dual representation theory argues that activation of memories can lead not only to recovery but also to chronic emotional processing (permanent preoccupation with consequences of trauma and intrusive memories), or to premature inhibition of processing that results from avoidance and is associated with continued phobic avoidance, somatization, and vulnerability to reactivation later in life.[53] When PTSD symptoms become chronic, this is thought to reflect a failure to engage in successful emotional processing of the traumatic experience, because avoidance limits activation of the memory and access to new, corrective information.[54]

Following this thinking, it is the job of the treating provider to encourage conditions for change and reduce emotional avoidance. Deliberate therapeutic activation of traumatic memories is most directly attempted in exposure therapies that require the individual to repetitively talk about the trauma in detail and approach previously avoided trauma-related stimuli. During effective treatment, therefore, avoidance is limited and new information of many kinds is purposefully incorporated into the memory. The individual learns that it is not dangerous to remember the trauma and experience strong emotions, that events can be remembered deliberately with a feeling of personal control and manageable physical reactions, that the trauma memory may not be completely accurate and must be updated, and that some beliefs or judgments about the experience can be challenged and changed.

Although most theories of PTSD emphasize the relationship of fear to the development of PTSD, combat and other deployment-related traumas often activate other intense emotions—including sadness, anger, and guilt—that can be connected to the development of PTSD and other posttrauma problems. In Operation Iraqi Freedom (OIF), for example, substantial percentages of US Army and US Marine Corps personnel reported potentially traumatic experiences that included not only events likely to be associated with fear ("being attacked or ambushed"), but also those related to loss ("knowing someone seriously injured or killed"), moral conflict ("being responsible for the death of a noncombatant"), horror ("handling or uncovering human remains"), or helplessness ("seeing ill or injured women or children whom you were unable to help").[44] These types of experiences are associated with a range of intense emotions that can continue to trouble trauma survivors. Some of these emotions are fueled by negative interpretations or appraisals (of personal behavior during the trauma, or the effects of the trauma); thus it may be important to supplement exposure interventions with those explicitly designed to modify appraisals. The cognitive theory of PTSD emphasizes "idiosyncratic negative appraisals of the traumatic event and/or its sequelae that have the

common effect of creating a sense of serious current threat"[52(p320)] and thus serve to maintain acute stress reactions.

Generally, cognitive-behavioral psychological theories and treatment of PTSD instruct that the trauma memory needs to be actively confronted, elaborated, and integrated into the context of the individual's preceding and subsequent experience; problematic appraisals that maintain sense of threat and other negative emotions need to be modified; and dysfunctional coping strategies that prevent emotional processing of the trauma, and thus recovery, need to be reduced.

TREATMENT OF DEPLOYMENT-RELATED POSTTRAUMATIC STRESS DISORDER

Treatment of PTSD depends upon a careful assessment of the individual. Treatment plan formulation should be based on judgments of factors that may have caused problems for that particular person, those that maintain them, co-occurring problems of the person, and priorities for intervention. Regardless of specific interventions, treatment of individuals with PTSD can be conceptualized as a temporal process that starts with client engagement, alliance building, and education about the nature of trauma, posttraumatic stress reactions, and the recovery process. This is followed by coping skills training or trauma-focused interventions or both—aspects of treatment that require greater involvement and commitment by the client. Finally, as treatment intensity is decreased, attention is focused on relapse prevention and maintenance of treatment gains.

Active Engagement and Alliance Building

In order for treatment of PTSD to commence, individuals with PTSD must present for care. However, many are reluctant to seek mental health treatment. Those experiencing higher levels of symptoms may be even less likely to seek help and report more barriers to help-seeking.[55] For example, four US combat infantry units were administered an anonymous survey 3 to 4 months after their return from combat duty in Iraq or Afghanistan.[44] Only 38% to 45% of the soldiers whose responses met criteria for a mental health disorder indicated an interest in receiving help, and only 23% to 40% reported having received professional help in the past year. Those screening positive for disorder were twice as likely to report concern about being stigmatized, as well as other barriers to seeking mental health services. In this study, barriers to seeking help included concern about being seen as weak, feelings of embarrassment, and concern about reactions from leadership. For some, another barrier to seeking treatment for PTSD within a Veterans Healthcare Administration (VHA) or Department of Defense (DoD) setting is fear that documentation of PTSD-related problems in the medical record might have an adverse effect on advancement in a military career or later employment in some civilian occupations (eg, police).

Screening programs can increase rates of identification of PTSD and rates of referral.[56] These screenings should occur at multiple points in time, given that soldiers have been found to report more mental health concerns 3 to 6 months following return than in the first month.[57,58] In some screening environments, however, there may be significant disincentives to give positive responses. Factors that may lead to underreporting of early postdeployment distress in military personnel include positive mood at the time of return, misattributions about existing symptomatology, and reluctance to endorse distress because of perceived stigma.[43] Although many who screen positive will not seek care, many individuals may nonetheless ask for help—35% of Iraq war veterans accessed mental health services in the year after returning home.[59]

Relatively little is known about the determinants of help-seeking in those with PTSD. Treatment seeking in Canadian veterans with lifetime PTSD was predicted by cumulative lifetime trauma exposure, traumatic event type, PTSD symptom interference, and comorbid major depressive disorder.[21] Those with comorbid depressive disorder were 3.75 times more likely to have sought treatment than veterans without concurrent depression. Multiple deployments are associated with greater levels of PTSD symptoms,[38] so that soldiers with more than one deployment should be monitored. In research with veterans, the failure of veterans with PTSD to seek VHA mental healthcare was found to be affected by personal obligations that prevented clinic attendance, inconvenient clinic hours, and current receipt of mental health treatment from a non-VHA provider.[60] Another study suggested that veterans' pursuit of mental health services appears to be driven more by their guilt, and the weakening of their religious faith, than by the severity of their PTSD symptoms or their deficits in social functioning.[61]

Outreach interventions can be investigated empirically. In a study of veterans who were service-connected for PTSD but not receiving PTSD treatment, half received an outreach intervention, and the other half were assigned to a control group.[60] The intervention group received a mailing that included a brochure describing VHA PTSD treatment and a letter telling them how to access care. These individuals were also

telephoned and encouraged to enroll in treatment. Results indicated that those receiving the intervention were significantly more likely to schedule an intake appointment, attend the intake, and enroll in treatment.

Initial presentation for help does not necessarily result in active involvement in the treatment process. The importance of this issue is highlighted by clinical experience with OIF veterans 1 and 2 years after their return to the United States. In VHA settings, many veterans come to one or two treatment sessions but do not begin active participation in counseling services. In fact, once an individual presents for help, clinicians must take steps to maintain attendance and achieve active engagement in the treatment process. It is important to assess for obstacles to participation and make efforts to ensure that treatment makes sense to these individuals and is perceived as relevant to their needs.

Ongoing Assessment and Monitoring of Treatment Effectiveness

Initial engagement in treatment can be expected to be affected by the assessment process. Assessment provides practitioners with an opportunity to inquire about perceived needs and to describe treatment in terms that make clear its relevance to those needs. This suggests that assessment must include not only attention to symptoms and problems, but also perceived areas of importance to the help-seeker (eg, partner and family conflict, sexual functioning, work functioning and satisfaction, and parenting experiences). The assessment interaction communicates interest in, and understanding of, the individual, as well as expertise on the part of the provider.

Assessment of military-related PTSD requires a multimethod approach in which multiple measures are used to assess different domains of functioning, both to improve diagnostic confidence and to identify multiple targets for intervention.[62] A few key issues can be identified. First, it is important for the provider to gather information about the individual's experiences during deployment. Use of self-report questionnaires, such as the Deployment Risk and Resilience Inventory, can make this process more complete and efficient for provider and patient.[63] Second, findings of high rates of lifetime physical and sexual victimization among veterans in treatment for chronic PTSD support the need for routine assessment of history of trauma exposure.[64] Adverse childhood experiences are strongly associated with mental health symptoms[65] and predict the presence of PTSD and depression among active duty soldiers seeking mental health services.[66] Third, it is important that clinicians engage in ongoing assessment and monitoring of treatment impact. Although this is not currently routine practice in many treatment settings, it is important to help provider and survivor evaluate the effectiveness of their work together, and make changes when necessary. The clinical practice guideline for PTSD, jointly developed by the VHA and the DoD, recommends routine use of validated self-administered checklists (and interviews as appropriate) at intake and to monitor follow-up status (at least every 3 months).[67]

Ongoing Interactive Education

Patient education comprises a basic component of most forms of psychotherapy for PTSD, and should be introduced early and continued throughout all stages of the treatment process. To this end, traumatic stress education classes are often included as part of a first phase of comprehensive treatment programs. Traumatic stress education includes a number of components: (*a*) information about how traumatic experiences can affect individuals; (*b*) information about common reactions to trauma; (*c*) "normalization" of reactions; (*d*) emotional support and reassurance; (*e*) presentation of a rationale for, and description of, what happens in treatment and what the individual will be asked to do; and (*f*) a description of how recovery can happen. Education for the family is also important. Although education alone is unlikely to result in remission of PTSD, it is important to building commitment to treatment participation and helping the survivor more clearly understand the traumatic experience and how to actively participate in treatment.[68]

Coping Skills Training

There is a great difference between knowing what to do versus knowing how to do it. Skills training methods are designed to help individuals learn and practice what to do to cope more effectively with the various kinds of situations that challenge them. Skills training methods are commonly used to help those suffering with PTSD to increase their ability to reduce anxiety, communicate with loved ones, manage anger, and respond assertively (not aggressively) to conflict situations. Through a cycle of instruction, demonstration, rehearsal/practice, feedback/coaching, and more practice, survivors learn skills in treatment sessions and practice them in the natural environment. They keep written records of their attempts to apply the skills, which help them learn and provide practitioner and survivor with real-world experiences to review. Clinical experience indicates that survivors are typi-

cally attracted to the idea of learning skills ("tools") for coping. The methods of skills training help to actively involve the survivor in treatment, provide a greater sense of control (and responsibility for active participation in treatment), and strengthen the transfer of what is learned in treatment to the natural environment of the client. For example, stress inoculation training (SIT)[69] focuses on teaching the survivor skills for managing anxiety symptoms, and includes education, muscular relaxation training, breathing retraining (slow abdominal breathing), assertiveness training, covert (imaginal) modeling, role playing, thought stopping, and positive thinking and self-talk. SIT has been found to significantly reduce PTSD symptoms in some treatment research,[70] and is "strongly recommended" in the VA/DoD clinical practice guideline.

Deliberate, Planned Confrontation of Trauma Memories and Reminders

The core element of PTSD treatment is active discussion and exploration of traumatic experiences and their implications. The treatments that focus explicitly on traumatic memories and meanings—prolonged exposure (PE),[71] cognitive therapy (CT), and eye movement desensitization and reprocessing (EMDR)[72]—have received the most empirical support to date, and comprise three of the four "strongly recommended" treatments in the VA/DoD clinical practice guideline.

Methods of therapeutic exposure, such as PE, involve the most direct confrontation of memories and reminders. Imaginal exposure involves a repeated retelling of the trauma story with emotional activation. In vivo exposure adds real-world exposure to stimuli associated with the trauma via confrontation of avoided trauma-related stimuli in the natural environment. These procedures involve multiple repetitions achieved by listening to a cassette recording of the trauma narrative, writing about the experience, or approaching real-world trauma reminders systematically in between-session tasks. A combination of imaginal and in vivo exposure is thought to be more effective than either procedure alone. According to Foa and Jaycox,[73] PE treatment assists the individual to incorporate new information into the memory by reducing cognitive avoidance of trauma-related feelings, demonstrating that remembering the experience is not dangerous and that anxiety will diminish via habituation, fostering discrimination between the trauma and similar nontraumatic situations, strengthening ability to tolerate memories and thereby challenging perceptions of personal incompetence, and reviewing details of the experience that provide evidence against disabling beliefs about danger and incompetence.

Exposure to trauma memories is an element of a number of treatments other than PE that are supported in the research literature. For example, individuals being treated with cognitive processing therapy (CPT)[74] are asked to write out the details of their traumatic experience and to read the account on a regular basis. EMDR includes an exposure component that involves bringing to mind an image of a traumatic event while visually tracking a therapist's finger as it moves back and forth in front of the patient's visual field (or tracking a light moving back and forth, or listening to tones alternating from one ear to the other).

Challenging Negative Trauma-Related Thoughts

CT is a systematic approach that includes education about the role of beliefs in causing distress; identification of distressing beliefs held by the individual; discussion and a review of evidence for and against the beliefs; testing of beliefs; generation of alternative beliefs; and rehearsal of new, more adaptive beliefs. Thoughts that create significant distress (eg, trauma-related guilt, exaggerated thoughts about danger) are replaced with more realistic and self-supportive thoughts. For example, if an individual has the thought "I will never be safe again, the world is a very dangerous place," CT might focus on helping the individual to consider evidence for and against the belief and move toward a more realistic appraisal (eg, "I am safe in most situations and the chances of harm coming to me are quite small in the civilian world"). It is often important that trauma-related guilt be made a formal target of PTSD treatment, and some interventions with a strong CT component, such as CPT[74] and CT for guilt,[75] target guilt explicitly. Instruments designed to assess guilt (eg, Trauma-Related Guilt Inventory[76]) and other trauma-related beliefs (eg, Post-Traumatic Cognitions Inventory[77]) are available.

Negative thoughts can be challenged through direct review of the belief and consideration of alternatives, and through encouraging real-world experiences that can help to disconfirm them. For example, having a successful experience in disclosing personal information to another person can help challenge the belief that "other people cannot be trusted." Successful implementation of PE can also result in modification of distressing trauma-related cognitions by disconfirming beliefs ("anxiety stays forever" or "I will go crazy") and helping the survivor differentiate the trauma from similar but safe events (disconfirming "the world is extremely dangerous"). PTSD symptoms themselves may begin to be associated with mastery rather than incompetence (disconfirming "I am incompetent").

Pharmacotherapy

Medication is an important treatment option that should be considered for almost all patients with significant symptoms of PTSD. The use of a medication in these patients may be directed at PTSD symptoms generally, specific symptoms, common co-occurring symptoms, or comorbid conditions (eg, depression). Initiating a medication trial may occur at different phases in treatment, depending on patient-specific factors. As mentioned earlier, those patients with high levels of symptoms may be the most reluctant to seek psychotherapy care. A medication initiated within the primary care setting may reduce symptoms to a level such that this reluctance can be overcome. However, many military patients may be concerned about the potential side effects of a medication or the stigma of taking a "psych drug" and will need to build trust with their mental health provider before starting a medication can become an option.

Despite the wide use of a variety of medications for the treatment of PTSD, there is a relative lack of definitive evidence for their efficacy.[78] The most thoroughly investigated agents are the selective serotonin reuptake inhibitors (SSRIs). SSRIs have demonstrated superiority over placebo in large randomized controlled trials (RCTs) as well as in a number of smaller investigations, and they are now considered the first-line pharmacological treatment option for PTSD.[79] Sertraline and paroxetine have been subjected to large industry-sponsored trials for the acute treatment of symptoms and have received US Food and Drug Administration approval for treating PTSD.[80–82] Fluoxetine, escitalopram, and citalopram have shown efficacy in smaller randomized or open trials.[83,84] In these trials, SSRIs improved all three clusters of symptoms in PTSD, as well as quality of life and functional impairments. They appear effective in preventing the relapse of symptoms once a patient has responded to treatment.[81,85,86] But the data on SSRIs in the treatment on PTSD in certain populations, including combat veterans, are still limited.[78]

SSRIs have proven effectiveness for many other anxiety and depressive disorders that are highly comorbid with PTSD. PTSD and major depression overlap to a considerable degree; both share sleep disturbances, social withdrawal and isolation, decreased pleasure and enjoyment, and impaired concentration. Major depression is the most common comorbid disorder in patients with PTSD, with close to 50% of PTSD subjects having a history of major depression.[25] Although SSRIs improve both PTSD and depression, SSRIs are efficacious for both PTSD patients with and without depression.[82] Panic disorder and generalized anxiety are also responsive to SSRI treatment and also often co-occur with PTSD.[87]

As with most other disorders treated with antidepressants, a full therapeutic response to SSRIs in PTSD takes 4 to 6 weeks. Although better tolerated than older antidepressants, SSRIs are not without side effects that can include nausea and gastrointestinal distress, insomnia, akathesia, and sexual dysfunction. Many of these side effects are time-limited but still result in relatively high rates of medication discontinuation.[88] Education and support by all members of the treatment team are vital to prevent early discontinuation.

Other antidepressants have less empirical support for the treatment of PTSD than do SSRIs, but available evidence suggests similar efficacy. Therefore, non-SSRI antidepressants should be considered as second-line medication treatment options for PTSD. Antidepressants with RCT data supporting their use in PTSD include venlafaxine,[89] mirtazapine,[90] and nefazodone.[91] Clinically, the choice of an antidepressant is often based on comorbid symptoms and conditions. Venlafaxine, as well as duloxatine, are efficacious in some chronic pain conditions[92] and may be useful in PTSD patients with diabetic neuropathy, fibromyalgia, or certain other pain disorders. Mirtazapine is generally sedating and may be useful in targeting insomnia in PTSD, but weight gain can be a problem. Although the efficacy of bupropion in PTSD is uncertain,[93] it is an option for patients with PTSD who are also attempting to stop smoking.[94] There is limited RCT data to support the efficacy of tricyclic antidepressants and monoamine oxidase inhibitors. Furthermore, their clinical use is limited by their higher rate of side effects, from common dry mouth and constipation to more serious cardiac conduction delays and a lower safety index in overdose. Noradrenergic reuptake inhibiting tricyclic antidepressants, such as nortriptyline, are efficacious for chronic pain conditions[92] and may also be used in PTSD patients with these conditions. Trazodone is widely used at lower dose as a hypnotic in PTSD due to lack of addiction potential.

If antidepressant treatment fails to produce a sufficient treatment response, other psychopharmacological treatment options are available, but with even less empirical support. After antidepressants, the atypical antipsychotics have the most RCT data supporting their efficacy in the treatment of PTSD. Data support their use either as an augmentation therapy to SSRI treatment[95–98] or as a single agent therapy,[99] although not all studies have been positive[100] and the studies conducted to date have been limited in size. In addition to targeting core PTSD symptoms, atypical antipsychotics are often used to treat comorbid psychotic symptoms[96] or as mood stabilizers to treat symptoms

related to bipolar disorder or symptoms associated with borderline personality disorder. Another class of mood stabilizers, the third-generation anticonvulsants, had shown promising findings in early clinical case reports and open-label investigations, but small RCT investigations of valproate,[101] topiramate[102] and tiagabine[103] have all failed to demonstrate statistically significant efficacy in PTSD. Therefore, their use should be limited to treating refractory cases or comorbid mood disorders.

Agents targeting noradrenergic neurotransmission have been proposed as possible treatments for PTSD, based in part on the role noradrenergic neurons play in the biological response to stress.[104] Due in part to their ability to decrease central and peripheral noradrenergic activity, the α-2 adrenergic receptor agonists clonidine and guanfacine had been suggested as treatments for PTSD. But RCT investigations of guanfacine have failed to demonstrate efficacy in patients with chronic PTSD.[101,105] Centrally active β-adrenergic receptor antagonists, such as propranolol, may influence how stressful memories are stored[106] and have been efficacious in some,[107] but not all,[108] preliminary studies in preventing the development of PTSD in traumatized individuals. There are also limited data indicating that the α-1 adrenergic agonist prazosin has efficacy in treating nightmares and sleep disturbances in PTSD patients.[109,110] Both propranolol and prazosin are currently under investigation in larger RCT trials.

Benzodiazepines are effective in treating time-limited anxiety, but have significant dependence and abuse potential and are associated with adverse effects, including short-term memory impairment. Small RCTs have failed to demonstrate efficacy for benzodiazepines in the treatment of PTSD[111,112] or in preventing the development of PTSD in trauma survivors.[113] If benzodiazepines are prescribed, they should be used in a time-limited manner and with great caution in patients with PTSD due to the high rates of substance use disorders.[114]

A possible problem with prescription of medications (as with nonpharmacological interventions) is nonadherence to appropriate use. Indeed, many trauma survivors discontinue their medications without discussion with their provider. It can often be important to explore the meaning of medication for the person. When survivors interpret their need for medication as a sign of personal weakness or inability to cope, a judgment of failure in psychotherapy, evidence of the clinician's lack of personal interest, or avoidance of dealing with the "real" problem, they may be less likely to adhere to appropriate use.

In summary, medications, particularly antidepressants, may reduce the overall severity of PTSD symptoms and serve as useful tools in the treatment of PTSD. Psychotropic medications may also be used to treat associated features or comorbid conditions or both. But the practitioner and the patient must be aware that, with the exception of antidepressants, their use is off label. Drug treatments for PTSD should not be used as a routine first-line treatment in preference to a trauma-focused psychological therapy. Individuals with PTSD should be offered a course of trauma-focused cognitive-behavioral therapy or EMDR, regardless of time since trauma.[115] If the PTSD sufferer reports little or no improvement after one of these psychological treatments, an alternative trauma-focused treatment, and then augmentation with pharmacological treatment, can be considered. It is important to consider the least restrictive or intrusive treatment model and choose efficacious treatments.[116] Medications may be warranted, particularly when symptoms are significant and daily functioning is severely impaired, the person has severe insomnia, an additional psychiatric condition (eg, depression) is present, or if significant symptoms are still present following psychological treatment. Polypharmacy can occur in patients with PTSD in the absence of empirical support[117] and should be avoided.

Maintenance and Relapse Prevention

Relatively little is known about rates and processes of relapse after treatment for PTSD. Studies in the civilian sector suggest that improvements resulting from use of evidence-based treatments can be maintained for significant periods of time.[118] Some evidence suggests that patients discharging from residential PTSD treatment and referred for outpatient aftercare are more likely to make an outpatient visit within 1 month of discharge if they receive biweekly telephone calls after discharge.[119] Research also suggests that long-term treatment of PTSD with SSRIs maintains treatment response and quality-of-life improvements, and that discontinuation of SSRI treatment after 12 weeks results in a greater relapse risk, compared with extended treatment.[120]

ASSOCIATED PROBLEMS IN POSTTRAUMATIC STRESS DISORDER TREATMENT

As noted above, approximately 80% of those diagnosed with PTSD experience concurrent additional mental health disorders.[25] They also experience a range of problems in living that are often addressed in treatment. PTSD symptoms are associated with reduced quality of life before treatment. Evidence suggests that

positive change in PTSD is significantly associated with positive change in quality of life.[121] Most PTSD outcomes research has focused on reduction of PTSD symptoms; the impact of treatment on the wider range of quality of life and functional outcomes is less well investigated. Successful treatment should be accompanied not only by a reduction in PTSD symptoms but also by an improvement in quality of life.[122] To address the many problems for which those with PTSD seek help, it will often be important to supplement PTSD symptom-focused interventions with adjunctive treatment components targeted at other clinically significant problems identified in the assessment process, especially if these problems do not remit once PTSD-focused interventions have been provided.

Substance Abuse and Addictive Behaviors

Co-occurrence of PTSD and substance abuse (SA) problems is well documented in populations of civilians and veterans.[123,124] For example, Kulka et al[13] reported that 73% of Vietnam veterans with PTSD met criteria for lifetime alcohol abuse or dependence. It is likely that untreated alcohol and drug problems will impede treatment of PTSD; continuing PTSD symptoms may make sobriety more difficult to achieve. Some research suggests that veterans with PTSD who also abuse substances will benefit more from SA treatment if they also address PTSD. Patients who received PTSD treatment in the first 3 months following discharge from SA treatment were more likely to be in remission from substance use disorders at follow-up than those who did not receive PTSD treatment.[123] The interconnectedness of these disorders has generated increased development of integrated PTSD/SA treatments.[125] However, the widespread organization of PTSD and SA care in separate clinics, and the lack of cross-training of professionals in these areas, are among the impediments to delivery of integrated care.

Evidence also suggests that PTSD is associated with increased risk of smoking[26] and that unremitted PTSD is a risk factor for late-onset smoking among individuals who were nonsmokers prior to developing PTSD.[126] In an RCT, McFall et al[127] demonstrated that smoking cessation intervention incorporated into routine mental health care for PTSD is more effective than treatment delivered separately by a specialized smoking-cessation clinic.

Other addictive behaviors may also be associated with PTSD. In civilians seeking treatment for pathological gambling, frequency of PTSD symptoms has been found to predict greater lifetime gambling severity.[128] A study of Australian PTSD treatment-seeking veterans found that the veterans were likely to be problem gamblers, but that PTSD was unrelated to the behavior.[129] However, because all subjects had PTSD, the study was not optimally designed to detect a relationship.

Depression and Suicidality

PTSD is strongly comorbid with depression.[18,23,25,38,130,131] For example, Vietnam veterans with PTSD have higher levels of depression than veterans without PTSD.[13] In retrospective studies, most individuals with both disorders report that PTSD developed first.[25] A 2-year prospective study of the temporal relationship between PTSD and depression symptomatology in Gulf War veterans indicated a bidirectional relationship in which initial PTSD symptoms predicted increases in depression symptoms and initial depression symptoms predicted PTSD, although initial PTSD symptoms were more strongly predictive of later depression.[132] Breslau et al found greatly increased risk for major depression in persons with PTSD,[23] but not in exposed persons without PTSD, suggesting that exposure to traumatic events does not increase the risk for major depression independent of its effects on PTSD.

Presence of PTSD is associated with increased risk of suicide. Sareen et al used data from the nationally representative National Comorbidity Survey to investigate the relationships between anxiety disorders and suicidal ideation and attempts.[133] PTSD was significantly associated with suicidal ideation and suicide attempts; none of the other anxiety disorders showed such an association. Generally, PTSD in US Army veterans is associated with mortality from external causes, including homicide, suicide, drug overdoses, and unintended injury.[134] Clinicians treating PTSD should therefore routinely screen for suicidality and remain alert to the need to monitor suicidal ideation and provide preventive interventions.

Anxiety

PTSD, itself classified as an anxiety disorder, is highly comorbid with other anxiety disorders, including panic disorder, generalized anxiety disorder, social anxiety disorder, obsessive-compulsive disorder, and phobias. Among veterans receiving medical care in primary care clinics, those with PTSD have greater rates of social anxiety disorder (22%) than those without PTSD (1.1%).[135] Development of obsessive-compulsive disorder can be precipitated by trauma in combat.[136] Little research has examined the impact of PTSD treatment on co-occurring anxiety problems, but a treatment for

individuals with PTSD who also experience panic attacks has been developed.[137]

Anger and Violence

Anger and irritability comprise one of the symptoms of PTSD. Intense anger is commonly part of the presentation of those with PTSD[138] and is more significant among those whose traumas were experienced during military service.[139] Vietnam veterans with PTSD have higher levels of anger than veterans without PTSD,[13] and high levels of anger have been reported among Iraq and Afghanistan War veterans.[140] Compared to veterans without PTSD, those with it take less time to feel anger, have greater mean heart rate and diastolic blood pressure responses during relived anger, and report greater anger and anxiety during a laboratory task in which they are asked to relive a self-chosen anger memory.[141]

The volatile anger reactions of their patients can present treatment providers with challenges in establishing therapeutic relationships and in delivering treatment itself. In a study of Australian veterans, anger at intake was the most potent predictor of failure to show symptom change.[142] Anger might interfere with the confrontation with, and processing of, traumatic memories that can be important in recovery from the disorder.[71] A high level of anger at the beginning of PE treatment interferes with response to treatment.[143] Anger reduction should often be made an explicit goal of treatment; individuals can be taught skills (eg, time out/cool down, anger self-monitoring, identifying anger situations, relaxation/breathing, anger discrimination, self-talk, assertion training) to reduce their anger or modify its expression.

Anger problems may also require the provider to assist the veteran in reducing risk of violence. Research has indicated that veterans receiving inpatient treatment for PTSD are more violent than male psychiatric inpatients without PTSD and community Vietnam veterans with PTSD not undergoing inpatient treatment.[144] Domestic violence may be an accompanying problem,[145,146] and experiencing PTSD symptoms increases risk for perpetrating intimate partner violence.[147] Moreover, veterans with PTSD often have ready access to weapons and engage in potentially dangerous firearm-related behaviors.[148] Thus, clinicians should routinely address gun storage and safety issues as part of the treatment process.

Complicated or Traumatic Bereavement

Many of those deployed to a war zone will be exposed to significant personal losses, and these deaths will often be encountered in traumatic circumstances. Traumatic bereavement can lead to anhedonia and depression; grief about fallen friends can make social interaction and activity seem pointless. Loss of close comrades and friends in battle is associated with postwar distress and social dysfunction.[149,150] Pivar and Field found that grief-specific symptoms can be distinguished from other war trauma-related symptoms in combat veterans with PTSD. In their sample, veterans' mean scores on grief measures 30 years after their losses were higher than those found in studies of midlife individuals whose spouses had died within the previous 6 months.[151] The authors argued that unresolved grief will endure over time for many individuals if not addressed by clinical intervention. Indeed, treating symptoms of unresolved grief may be as important as treating fear-based symptoms associated with PTSD. Unfortunately, treatment for traumatic or complicated grief has received relatively little formal evaluation. However, most treatments include education about grief, restructuring of cognitive distortions about events, restoration of positive memories of the deceased, acknowledgment of caring feelings toward those lost, retelling the story of the death, and help in tolerating painful feelings.[152] Elements of treatment for PTSD can be adapted for treatment of complicated grief.[153]

Physical Health Problems

PTSD is associated with poorer perceived health status, greater somatic complaints, greater number of chronic health problems, and increased levels of healthcare utilization.[13,18,154–156] Overall, studies suggest that PTSD mediates the relationship between war zone exposure and physical health for both men and women.[155] The majority of veterans seeking PTSD treatment do not engage in preventive health behaviors (eg, exercise and medical screening) at levels consistent with healthcare guidelines.[157] These issues should be assessed and, if necessary, addressed in treatment.

Attention to management of health problems in veterans with PTSD is especially important in light of the "graying" of the veteran population. Veterans with PTSD report greater increases in psychological and physical symptoms during retirement than other veterans.[158] Some research suggests that the challenges of aging may be associated with exacerbation of PTSD symptoms.[159,160] Davison and colleagues, for example, described a phenomenon observed in aging combat veterans that they labeled late-onset stress symptomatology, or "LOSS." For many veterans who experienced highly stressful combat events in early adulthood, and then managed to function successfully throughout

their lives without chronic stress-related disorders, the changes of aging are associated with increased combat-related thoughts, memories, and symptoms.[159] The strong relationships between PTSD and health outcomes also extend to OIF returnees.[161] For this latter population, early severity of physical injury is strongly associated with development of later PTSD or depression.[162] Such findings support the need for increasing integration of mental health screening and services in primary care and other medical settings.

Traumatic Brain Injury

The high rate of co-occurring traumatic brain injury (TBI) and PTSD in those returning from deployment to Iraq and Afghanistan poses clinical challenges that are ill understood at present. Evidence suggests that PTSD can develop following both mild and severe TBI, even in individuals who have lost consciousness during the event or display posttraumatic amnesia.[163] In one study of military personnel deployed to Iraq, mild TBI (ie, concussion) was found to be strongly correlated with PTSD and physical health problems 3 to 4 months after return to the United States. The relationship between mild TBI and health was largely mediated by PTSD and depression.[164] Thus, PTSD treatment for those with TBI may need to include modifications that address difficulties that may be associated with injury, including difficulty in retrieving the traumatic memory, comprehending and remembering treatment recommendations, and reporting on symptoms and experience. Bryant et al demonstrated that civilians diagnosed with mild TBI and acute stress disorder could be effectively treated with a brief cognitive-behavioral therapy protocol designed to prevent development of PTSD.[165]

AREAS OF IMPAIRED FUNCTIONING

Family

The anger, emotional numbing, and social withdrawal often associated with PTSD can isolate veterans from their families. PTSD veterans and their partners report more problems in their relationships and more difficulties with intimacy (and have taken more steps toward separation and divorce) than veterans without PTSD and their partners. The degree of relationship distress is correlated with the severity of veterans' PTSD symptoms, particularly symptoms of emotional numbing.[34] Emotional numbing symptoms are also correlated with perceived relationship quality with children.[166] Higher levels of PTSD symptoms (avoidance and emotional numbing symptoms in particular) may lower parent–child relationship satisfaction.[167] Men reporting combat as their worst trauma are more likely to be divorced and physically abusive to their spouses than men reporting other traumas as their worst experience.[168]

Partners of those with PTSD are significantly affected by the symptoms of their loved one and experience burdens associated with care giving.[169] Compared to partners of Dutch peacekeepers without PTSD symptoms, partners of peacekeepers with PTSD symptoms reported more sleep and somatic problems, more negative social support, and poorer marital relationships.[170] PTSD symptomatology places veterans at increased risk for perpetrating relationship aggression against their partners.[171] Such findings suggest that more attention should be paid to supporting partners. Treatment goals should include reduction of problems for the partner and family.

A treatment focus on improvement of family functioning would suggest that steps should be taken to more systematically involve spouses or partners in care.[172,173] Significant others can be included in the assessment process, in the setting of treatment goals, and in treatment itself. Although couples' interventions require systematic development, early work suggests that they can reduce survivors' self-reported levels of anxiety and depression.[174] However, combining family therapy with exposure is not more effective than exposure alone in reducing symptoms of PTSD.[175]

Social Connections

Military-related PTSD is often associated with withdrawal from participation in social activities, limited friendships, and reduced emotional intimacy.[34,176,177] As noted above, some research suggests that veterans with PTSD have greater rates of social anxiety disorder. Poor social support predicts development of PTSD and a more chronic course of the disorder. Veterans with PTSD who are more involved in the community are more likely to show remission in PTSD symptoms than those with less community involvement[7] and adjustment to peacekeeping stressors is significantly related to self-disclosure, especially to supportive significant others.[178] Overcoming problems in social functioning and promoting social participation may require active, sustained intervention. When indicated, improvements in social functioning should be established as a formal treatment goal.

Workplace

Evidence indicates that PTSD impairs work performance and reduces work productivity.[179] Savoca and Rosenheck found that, on average, veterans with a lifetime diagnosis of PTSD were less likely to be currently working than veterans who did not meet diagnostic criteria.[180] Among those who were employed, veterans with PTSD earned less per hour. Veterans with more severe symptoms were more likely to work part-time or not at all. Men reporting combat as their worst trauma are more likely to be unemployed, or fired, compared to men reporting other traumas as their worst experience.[168] It has been suggested that even modest reductions in PTSD symptoms may lead to employment gains, even if the overall symptom levels remain severe.[181]

No interventions to date have targeted the workplace functioning of individuals with PTSD. It would, however, seem useful for clinicians to assist employed patients to apply stress and anger management skills on the job. Patients could also be taught to use problem-solving skills in difficult situations. These strategies would help reduce the impact of traumatic stress reactions on this important domain of patient functioning.

TREATMENT OUTCOME RESEARCH

Reviews of the impact of PTSD interventions have generally concluded that PTSD treatment can be efficacious.[182] In their meta-analysis of PTSD outcome studies, Bradley and colleagues[183] reported that 40% to 70% of trauma survivors included in controlled research trials showed substantial reduction in symptoms or were no longer diagnosable with PTSD posttreatment. To what extent these gains are sustained beyond 6 to 12 months following completion of treatment is relatively unknown. Although there is little empirical support for group-administered treatments at present,[184,185] research suggests that several kinds of individually administered psychological interventions, including exposure-based interventions (eg, PE), EMDR, CPT, and SIT, are effective in reducing PTSD symptomatology.

CPT and PE were compared in treating a sample of chronically distressed rape victims with PTSD.[186] Compared to a group of victims receiving only minimal attention and assessment, both treatments were effective in reducing PTSD and depression symptoms. CPT was superior to PE in reducing some kinds of guilt cognition. Some research has suggested that adding CT to PE appears not to improve PTSD outcomes,[187,188] but findings are mixed.[186,189] It should be noted that although CT and exposure have been separated for research purposes, they are usually combined in clinical practice. For example, PE treatment includes extensive processing of trauma memories that assists in modification of trauma-related cognition. CPT combines repeated writing about the trauma memory with a systematic approach to challenging negative beliefs or meanings associated with the trauma.

The few studies that have compared CT and imaginal (not in vivo) exposure have found no significant differences between the two approaches at the end of treatment.[190] However, a long-term, 5-year follow-up of patients who had taken part in a randomized clinical trial comparing imaginal exposure and CT showed a clear superiority of CT,[191] although there had been no difference at 12 months posttreatment. Those receiving CT showed significantly fewer PTSD symptoms and were less likely to meet criteria for PTSD. Indeed, no patients who received CT were diagnosed with full PTSD, compared to 29% of those who received imaginal exposure. These results cannot be generalized to exposure treatments, however, because imaginal exposure should be combined with in vivo exposure for best effects.

There is little research comparing cognitive-behavioral or other psychological interventions to medications or examining the combination of these approaches for treating PTSD. Individuals with PTSD were randomly assigned by van der Kolk et al to eight sessions of EMDR, 8 weeks of fluoxetine, or placebo. Immediately following treatment, there were no differences among the three groups. At 6-month follow-up, the EMDR group was more likely to show reductions in PTSD symptom severity and remission and depression symptoms than the other two groups.[192] For individuals showing only a partial response to sertraline, PE treatment has been found to further reduce PTSD severity following 10 weeks of medication treatment.[193] More research is needed before recommendations regarding the relative and combined effectiveness of medications and psychosocial interventions can be made with confidence.

Research With Veterans and Active Duty Military Personnel

Several studies have examined various trauma-focused interventions with veterans who have combat-related PTSD. Individually administered imaginal (without in vivo) exposure has been associated with modest but significantly improved PTSD symptom

outcomes compared to other treatment as usual.[194–196] Glynn et al found that a combination of imaginal exposure plus cognitive restructuring was more effective than a wait-list control condition.[175] These studies also suggested that in veterans with chronic PTSD, avoidance and emotional numbing symptoms may respond less well to treatment than symptoms of reexperiencing and hyperarousal.

Schnurr et al compared two treatments for male veterans with chronic PTSD: (1) trauma-focused group psychotherapy, and (2) a present-centered comparison treatment that avoided detailed discussion of the military trauma.[197] Weekly group treatment was provided for 30 weeks (followed by 5 monthly "booster" sessions). Follow-up assessments were conducted at the end of treatment (7 months) and at the end of the booster sessions (12 months). A subset of participants was also followed up at 18 and 24 months. Both treatments resulted in modest but significant improvements in PTSD symptoms and other outcomes, but no differences between the two interventions were observed.

In a trial of CPT, significant improvements were reported in PTSD and comorbid symptoms in those receiving CPT compared with a wait-list control group.[198] Forty percent of the intention-to-treat sample receiving CPT did not meet criteria for a PTSD diagnosis at posttreatment, and 50% had a reliable change in their PTSD symptoms.[198] The positive effects of CPT extended beyond PTSD symptoms to include improvements in frequently co-occurring symptoms of depression and general anxiety, affective functioning, guilt, and social adjustment. This trial provides some of the most encouraging results to date related to treatment of male veterans with chronic PTSD.

Positive results have also been obtained with female veterans with chronic PTSD. Schnurr et al compared two types of individually administered cognitive-behavioral therapy—PE and present-centered therapy (a supportive intervention)—for female veterans with PTSD in an RCT. PE treatment was associated with greater reduction of PTSD symptoms, decreased likelihood of meeting PTSD diagnostic criteria, and greater total remission (15.2% vs 6.9%) posttreatment and at follow-up.[199] This study is especially significant in that it demonstrated increased impact of PE when compared with a well-designed alternative treatment, and when delivered by practitioners in the VHA and DoD health care systems.

Studies have also investigated the effectiveness of EMDR as a treatment for veterans with PTSD. A number of studies have produced positive findings with veterans,[200,201] but there is some reason for concern that changes may not be maintained over time. For example, Devilly and colleagues found that Australian veterans treated with EMDR were initially more likely to display reliable posttreatment improvement in trauma symptomatology than those in a control group, but that at 6-month follow-up, reductions in symptomatology were not maintained and there were no differences between groups.[202] A 5-year follow-up evaluation of 13 US combat veterans of the Vietnam War with chronic PTSD who participated in a study of EMDR found that the moderate therapeutic benefits that were obtained immediately were lost at 5-year follow-up. Furthermore, there was an overall worsening of PTSD symptomatology over the 5-year follow-up period in both EMDR-treated subjects and nontreated control subjects.[203]

Some research with veterans has targeted the sleep disturbance associated with PTSD. In a placebo-controlled, blinded study of veterans of multiple conflicts, prazosin was found to be significantly more effective than placebo in reducing trauma nightmares, improving sleep quality, and improving the general clinical condition of the treated patients.[204] Prazosin has also been effective with OIF returnees.[205] In an uncontrolled investigation, Forbes et al offered preliminary evidence for the impact of imagery rehearsal therapy in veterans with PTSD.[206] The treatment reduced nightmare frequency and intensity and overall PTSD, depression, and anxiety symptomatology. Changes were maintained at 12-month follow-up. Some research has suggested that imagery rehearsal therapy can reduce nightmares and improve sleep quality in civilians with PTSD.[207]

In a comprehensive review of PTSD treatment effectiveness, the Institute of Medicine Committee on Treatment of Posttraumatic Stress Disorder applied conservative methodological criteria and found that the research evidence is sufficient to conclude that exposure therapies are efficacious in the treatment of PTSD.[208] The Institute of Medicine found that the evidence for other psychopharmacological treatments and psychosocial interventions is inadequate to reach clear conclusions. It was also judged that the evidence supporting PE was less consistent for veteran populations, especially male veterans with chronic PTSD. Generally, treatment outcomes in veteran samples have been less robust than those obtained with civilian groups.[183] The reasons for this are not well understood, but may include a number of factors. Those who seek treatment at VHA hospitals may have more severe pathology than some civilian samples. Veteran samples have typically been characterized by PTSD that has existed for many years. Veterans seeking care for chronic PTSD may represent a treatment-refractory subgroup of the more general PTSD veteran population. Veter-

ans whose problems were more malleable may have already recovered and thus be underrepresented in the treatment system. The PTSD disorder commonly observed in veterans may also differ in various ways from PTSD among other groups. Or, the compensation system for PTSD may cause some veterans to be reluctant to report symptom improvement.

Posttraumatic Stress Disorder Program Evaluation

Some uncontrolled studies have evaluated individual treatment programs for veterans.[209,210] Johnson et al analyzed the outcome of a 4-month intensive inpatient program for combat-related PTSD among Vietnam veterans.[209,210] Comprehensive measures of PTSD and psychiatric symptoms, as well as social functioning, were assessed at admission, discharge, and 6, 12, and 18 months after discharge from the intervention program. The study showed an increase in symptoms from admission to follow-up, but a decrease in violent actions, thoughts, and legal problems. Family and interpersonal relationships and overall morale were improved at discharge but then returned to pretreatment levels at 18 months.

Johnson et al conducted a long-term follow-up of the program at 18 months and 6 years later because previous studies had shown that program impact on course of illness had been negligible.[211] The sample of 51 veterans showed an extremely high mortality rate of 17% over 6 years. Nearly three-fourths of the sample had experienced an inpatient hospitalization. **S**elf-ratings showed significant improvement in all areas of functioning except employment, and a positive view of the effects of the program. The majority had experienced some improvement in their ability to cope with their chronic illness and decreased their use of violence and substance abuse. Nevertheless, most continued to experience high levels of symptomatology with worsening of hyperarousal symptoms and social isolation.

Bolton et al studied veterans with PTSD who participated in a series of groups focusing on understanding PTSD (education), stress management, and anger management.[212] Although the impact on PTSD symptoms was small, there were moderate impacts on depression and overall life satisfaction, and strong declines in reports of recent violent behavior and improvements in self-reported physical health. Ready et al[185] evaluated a VHA specialized PTSD outpatient program that delivered a three-phase treatment that included group-based exposure therapy. At posttreatment and at 6-month follow-up, veteran patients showed significant reductions in PTSD symptoms.[185]

Findings of evaluations of individual PTSD programs are difficult to generalize to the larger population of treatment programs. However, larger scale evaluations of PTSD treatment are available. Creamer et al reported on the effectiveness of hospital-based programs for Australian veterans with PTSD.[213] These group-based programs deliver a set of cognitive-behavioral interventions, including psychoeducation about PTSD and its treatment; symptom management for anxiety and depression; anger management; interpersonal, problem-solving, and communication skills training; attention to substance abuse, physical health and lifestyle issues; and relapse prevention. Trauma focus work (or direct therapeutic exposure) is delivered in group or individual formats or both. Individual counseling is provided throughout the 12 weeks, in addition to regular medication reviews. Education and support are provided for veterans' partners, often in the form of a weekly group. Overall, individuals in these programs showed significant improvements in core PTSD symptoms, anxiety, depression, alcohol abuse, social dysfunction, and anger. Changes occurred most frequently between admission and 3 months posttreatment, and were maintained at 9 months. Patients and partners reported perceived improvement and strong satisfaction with treatment. Nevertheless, treatment gains were variable and, for most veterans, considerable pathology remained following the program. Creamer et al reported 2-year follow-up outcomes for 1,508 Australian veterans receiving care in the same treatment system. Self-report measures of PTSD,[214] anxiety, depression, anger, alcohol use, and general functioning showed significant improvements at 6 months (with smaller gains continuing through to the 24-month assessment) for PTSD (effect size = 0.8), anxiety (0.5), and depression (0.5). These results suggest that specialized treatment programs for combat-related PTSD can be effective and that improvements are maintained over time.

As noted earlier, existing treatments are often not as effective for veterans as they are for civilian populations with PTSD. Studies of individual programs attest to the difficulty of treating PTSD in veterans whose problems have lasted many years. Veterans themselves report greater satisfaction with participation in specialized PTSD programs than nonspecialized psychiatry programs[215] and high absolute levels of satisfaction.[216] National program evaluation in VHA PTSD residential rehabilitation programs shows significant decreases in PTSD symptoms, alcohol and drug abuse, and violence,[216] but the magnitude of changes in PTSD is modest. Increasingly, PTSD is treated in outpatient settings. Therefore, future research should compare the impact of various forms of intensive outpatient treatment on the full range of outcomes related to traumatization.

TOWARD IMPROVEMENT OF POSTTRAUMATIC STRESS DISORDER SERVICES

Despite the existence of a VHA-DoD clinical practice guideline for PTSD that spells out recommended practices derived from clinical consensus and research findings (available online at www.QMO.amedd.army.mil or www.oqp.med.va.gov/cpg/cpg.htm), there is wide variation in treatment of deployment-related PTSD within VHA[217] and DoD healthcare systems and in the civilian community. Programs vary along many dimensions, including the nature of interventions, intensity of treatment, balance of group or individual therapy, and relative reliance on psychosocial interventions versus medication. This variation reflects the fact that there are many ways of structuring care for PTSD and many treatment options that may in principle be concordant with treatment guidelines. However, variation in treatment practices illustrates the challenge of ensuring that key elements of practice guidelines are implemented in routine care. Central to service improvement is the dissemination of evidence-based treatments.[218] Consistent with reviews of the general PTSD treatment outcome literature, the VA/DoD clinical practice guideline endorses four interventions most strongly: (1) exposure therapy, (2) CT, (3) SIT, and (4) EMDR. In the past, empirically supported treatments for PTSD have not been widely available in most treatment settings, including military mental health settings and the VHA.[219] Some treatments, such as PE, have occasionally been seen as difficult or risky to administer, despite the fact that the evidence does not support the validity of these perceptions.[187,220] In the civilian community, Becker et al found that two major barriers to clinician use of exposure therapy in treatment of PTSD are (1) lack of sufficient training, and (2) concern about the safety of exposure therapy.[221] Findings from research evaluating whether more patients drop out from PE than other treatments for PTSD and whether PE causes symptom worsening have not supported such concerns.[222] Dissemination initiatives are now underway to ensure that PE and CPT are accessible to veterans and active duty personnel with PTSD.

In addition to implementation of evidence-based interventions, another important way to use evidence to enhance treatment delivery is to establish routine monitoring of outcomes in PTSD services. For the individual clinician, it is important to monitor changes in key indicators throughout treatment, to evaluate the impact of intervention, and to inform ongoing redesign of treatment. At the level of the treatment program, outcomes-based program evaluation can assist teams with redesign of services to ensure program improvement over time. Ongoing administration of validated questionnaires as measures of change has not been standard practice in PTSD treatment or in mental health treatment generally. With the use of computerized self-administration of measures, this situation can be expected to change, thereby leading to more rapid improvement of treatment.

In many settings, including the VHA, PTSD treatment is commonly delivered through programs that combine delivery of focal PTSD treatment with other intervention components designed to address concurrent disorders and difficulties.[223] Treatment of PTSD in such programs commonly involves participating in both individual and group activities that includes individual assessment, PTSD education classes, problem-targeted groups (eg, anger management groups, communication skills groups), trauma-focused interventions (eg, PE), case management, and pharmacotherapy. Treatment programs are often delivered in phases, with a beginning, middle, and end of active treatment, followed by lower-intensity maintenance support as needed. Little is known about the best way to organize these structures of care. More research into the types of services that are being provided and the real-world effectiveness of such services is required. Establishment of systematic outcome monitoring of treatment programs can facilitate research and enable comparison of treatment structure.

In fact, there are many treatments for PTSD and co-occurring problems,[224] and new treatments are being developed at an increasing rate. The increasing complexity of the field means that, especially in large-scale treatment systems like the DoD and VHA, it will be important to develop more effective ways to "manage knowledge" within the field of PTSD.[225] It will also be important to help providers upgrade their information, acquire new skills, and learn new interventions, as well as to assist providers and program managers in sharing experiences and learning from one another's efforts.

SUMMARY

Management of deployment-related PTSD has been changing rapidly. Screening for PTSD is widespread, returning personnel are informed about the disorder, and the VHA and DoD have collaborated to establish clinical practice guidelines for responding to the specific needs of those with PTSD. As treatment systems

evolve, it is critical that more and better quality evaluation of treatment effectiveness be undertaken. More treatment outcome research is needed, and program evaluative outcomes monitoring, if extended routinely to active duty and veteran treatment systems, can inform all aspects of care and enable more rapid and effective improvement of services. Because PTSD is associated with a wide array of co-occurring disorders and associated problems in living, assessment and program evaluation must be expanded beyond PTSD symptomatology. And because PTSD and other posttraumatic problems affect the whole family, their needs, too, should receive consideration when evaluating and providing services. More systematic monitoring of the effectiveness of PTSD services, along with increasing systemic and public knowledge of PTSD, will inform discussions on disability, fitness for military service, and, most importantly, what constitutes satisfactory support following deployment. As approaches to treatment of deployment-related PTSD continue to develop, the authors anticipate that use of evidence-based practices will increase, routine evaluation of outcomes will become standard practice, and care decisions will become increasingly guided by empirical data.

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