



Posttraumatic Stress Disorder: Developments in Assessment and Treatment

Charles W. Hoge, MD; and July Lies, MSc

Diagnostic discordance between posttraumatic stress disorder definitions, treatment dropout rates, comorbidities, and varying policy approaches leave VA and DoD clinicians with unique concerns in providing effective treatment for many postwar health problems.

The U.S. veteran population of about 22 million is estimated to represent > 9% of U.S. adults.¹ Of veterans using health services, a growing proportion have been deployed in Iraq or Afghanistan. The VA and DoD have made it a priority to address the health care needs of service members and veterans affected by these wars, with a particular focus on posttraumatic stress disorder (PTSD) and mild traumatic brain injury (mTBI). This review highlights key developments in assessment and treatment of PTSD.

EPIDEMIOLOGY

Although studies have produced widely varying estimates of the prevalence of PTSD following deployment to Iraq or Afghanistan, more consistent estimates have been obtained by appropriately grouping studies that used a similar methodology.² Current PTSD prevalence after Iraq and Afghanistan deployments has averaged 5% to 6% in general military population samples that included support personnel from all services (constituting about two-thirds of deployed forces) and 13% in studies that focused on operational infantry units exposed to direct combat.²

Among Iraq and Afghanistan war veterans who have sought care at VA treatment facilities, > 25% have received a diagnosis of PTSD (Karen H. Seal, MD, written

communication, December 2014). Although combat frequency and intensity is the most prevalent predictor of PTSD in this population, other types of trauma, such as sexual assault, can confer a risk as high as direct combat.³ Another strong correlate with postdeployment PTSD has been deployment-related mTBIs (concussions), especially following blast exposure. The most likely mechanism for this seems to be the extreme life-threatening context in which these concussions occur.⁴

Posttraumatic stress disorder has been linked with a host of comorbid conditions, including depression, anxiety disorders, substance use disorders, physical symptoms, anger, aggression, complicated grief, and risky behaviors.⁵⁻⁷ Deployments also have been shown to have cumulative effects on the psychological health of military spouses and children.^{8,9}

DIAGNOSIS

One of the most important developments in PTSD is the new definition, which was released in May 2013 in the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition* (DSM-5), replacing the definition that has proved highly useful for clinical, neurobiologic, research, and public health purposes for > 25 years.¹⁰ The PTSD definition underwent much more extensive changes in the DSM-5 than did any other common mental disorder affecting adults. Changes included moving this diagnosis out of the anxiety disorders chapter into a separate “Trauma- and Stressor-Related Disorders” chapter, which now includes adjustment disorder.

Dr. Hoge is a senior scientist at the Center for Psychiatry and Neuroscience, Walter Reed Army Institute of Research in Silver Spring, Maryland. **Ms. Lies** is a counsellor advocate for the Victorian Foundation for Survivors of Torture Inc. in Brunswick, Victoria, Australia.

The A trauma criteria were revised, including removal of criterion A2 (response of “fear, helplessness, or horror”), in part because individuals who train for traumatic events as part of military and first responder occupations often do not report this response. The 3 symptom-criteria clusters were divided into 4 clusters: B (intrusion), C (avoidance), D (negative alternations in cognitions and mood), and E (alternations in arousal and reactivity). Three symptoms were added, bringing the total from 17 to 20, and many symptoms were substantially reworded.

The implications of these revisions are an active area of investigation. However, initial evidence suggests that these changes have not necessarily improved the clinical utility of the definition.^{11,12} Although research suggests that the 2 criteria sets result in a similar prevalence of PTSD, they do not identify the same individuals, and there is no evidence that clinical accuracy is any greater when using the revised definition.

One head-to-head comparison of symptom criteria between the DSM-5 version of the PTSD Checklist (PCL-5) and the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition* (DSM-IV) version (PCL-S) among 1,822 infantry soldiers showed high discordance.¹¹ Of soldiers who met DSM-IV symptom criteria, 30% did not meet DSM-5 criteria, and an equivalent number only met criteria under DSM-5. This was one of the only studies that maintained independence of the 2 clinical scales (rather than adding DSM-5 symptoms to an existing DSM-IV scale). This study also controlled for the order in which the 2 scales were presented on the survey, which was found to be critically important.¹¹ Furthermore, there was no difference in the overlap with comorbid conditions (eg, major depression, generalized anxiety, alcohol misuse) and no difference in level of functional impairment, suggesting that the new definition has no greater specificity or clinical utility than does the original.

The diagnostic discordance between DSM-IV and DSM-5 was mostly accounted for by the redefinition of C criterion (avoidance) in DSM-5. In an editorial accompanying the comparison study, Alexander C. McFarlane, MD, AO, raised concerns about this decision and the decision to effectively remove the important symptom of numbing of emotions.¹² These changes could disenfranchise service members and veterans who learn to override avoidant behaviors through training and who often cope with their reactivity through emotional numbing.¹²

These various concerns, as well as years of experience with the original definition and importance of aligning trauma-focused treatment with the most appropriate diagnosis, suggest that clinicians have reasonable justification for continuing to assign the PTSD diagnosis for veterans who meet full criteria for PTSD under the previous DSM-IV definition.

Another clinical concern of the revision is the potential problem with selecting a diagnosis for subthreshold PTSD. Subthreshold PTSD can be broadly defined as PTSD symptoms that do not meet full criteria for diagnosis but impair functioning sufficiently for trauma-focused treatment to be indicated. DSM-5 recommends use of adjustment disorder in this circumstance.¹⁰ However, in military populations, this definition carries a pejorative connotation (weakness or failure to adapt) and can also lead to administrative separation without medical benefits if the condition has lasted < 6 months.¹³ Chronic adjustment disorder is medically compensable under VA and DoD regulations but suffers from poorly defined clinical criteria, in addition to the pejorative connotation. (Chronic adjustment disorder was inadvertently left out of the print version of DSM-5 but corrected online.)

As a result of these concerns, the VA National Center for PTSD has recommended that clinicians use ICD-9 code 309.89 (“other specified trauma- and stressor-related disorder” in DSM-5) instead of adjustment disorder for subthreshold PTSD.¹⁴ However, current DoD electronic medical record systems map this code to even more pejorative labels (eg, adjustment disorder with aggression, antisocial behavior, or destructiveness). Thus, until the VA and DoD adopt ICD-10 coding, which is expected to occur within the next year, clinicians will probably have to continue to use ICD-9 code 300.00 (“unspecified anxiety disorder” or “anxiety disorder not otherwise specified”) for clinically significant subthreshold PTSD.

CLINICAL TREATMENT

Although the VA and DoD have codeveloped a PTSD clinical practice guideline (CPG) and are working closely to ensure seamless transition of care, their policy approaches to PTSD treatment have been quite different.¹⁵ The VA has placed particular attention on training PTSD specialists in prolonged exposure (PE) and cognitive processing therapy (CPT) and ensuring that all veterans have access to one of these two “formulary,”

trauma-focused psychotherapies.¹⁶ U.S. Army and DoD policies have emphasized that PTSD treatment should be a core competency for all mental health providers and have interpreted the literature and CPG recommendations broadly, emphasizing the core components found in many different trauma-focused psychotherapies and encouraging use of a wide range of options.¹⁶

One of the reasons for DoD's approach has been the recognition that the most important threat to treatment efficacy is not the fidelity in which manualized treatments are delivered but the willingness of patients to engage in care and their rate of dropping out.^{16,17} Several studies from VA health care settings have shown that only one-third of Operation Enduring Freedom/Operation Iraqi Freedom veterans diagnosed with PTSD end up receiving a minimally acceptable number of treatment sessions to have reasonable expectation of recovery.¹⁸⁻²⁰ One study suggested that treatment adequacy is somewhat higher in DoD among active-duty soldiers (41%-52%), though still far from optimal.¹⁷

For treatment interventions, the VA/DoD CPG remains an authoritative guide, with A-level recommendations (strong evidence benefits outweigh harms) assigned to a wide range of trauma-focused psychotherapies as well as medications in the serotonin reuptake inhibitor and serotonin-norepinephrine reuptake inhibitor classes.¹⁵ However, despite a growing list of available pharmacologic choices, new developments in PTSD pharmacotherapy remain elusive. Prazosin, an alpha-1 receptor antagonist, has become widely used in service members and veterans, based on initial clinical trials, but release of findings from a recently completed VA multicenter cooperative clinical trial are still pending.^{21,22}

Pharmacologic enhancement of exposure treatment is an active area of research but has not yet produced sufficient evidence to change treatment recommendations.²³ Expensive clinical trials of hyperbaric oxygen for chronic postconcussive symptoms and PTSD in combat veterans have informed clinicians more about the nature of placebo responses than of anything else.²⁴ Benzodiazepines have received D-level recommendations (harm outweighs benefits) in the VA/DoD CPG yet continue to be prescribed relatively frequently to service members and veterans with PTSD.¹⁵ Temporary relief of anxiety symptoms is offset by the propensity of benzodiazepines to worsen or impede PTSD recovery through tolerance and dependence, rebound sleep disturbance or anger, and they seem to enhance rather than alleviate fear condition-

ing.^{15,16} Risperidone has received a D-level recommendation, based on the results of a large VA cooperative trial, and other atypical antipsychotics carry similar concerns, including metabolic and cardiovascular adverse effects.²⁵

Trauma-Focused Psychotherapy

For mental health professionals working with service members and veterans, the most important clinical strategy supported by strong evidence is to have a firm understanding of the core components of effective trauma-focused psychotherapy and deliver these in a patient-centered manner that fosters continued treatment engagement, which is the most important variable in predicting treatment effectiveness.¹⁵⁻¹⁷ The core components are:

1. *Narration of the traumatic event.* This is the single most essential component, besides the underlying therapeutic alliance, and there are many effective ways for therapists to facilitate the narrative process. These include imaginal exposure (as in PE), a linear life narrative approach (as in narrative exposure therapy [NET]), visualization of the traumatic event (as in eye movement desensitization and reprocessing [EMDR]), written narration (shown to be equivalent to the full manualized CPT package in a dismantling study²⁶), facilitation through virtual reality, and inherent narrative processes built into all forms of trauma-focused psychotherapies.^{15,16}
2. *Cognitive restructuring.* This may be delivered in a systematized manner, such as in CPT or EMDR, or more organically, as occurs in PE or NET. Cognitive restructuring, which fundamentally involves gaining a different perspective on the traumatic event(s) and one's responses (eg, coming to terms with guilt, self-blame, or pervasive mistrust), often emerges naturally during narrative processes.
3. *In-vivo exposure.* This involves graded exposure to activities that trigger symptoms, such as being able to shop at a grocery store during peak hours. In-vivo exposure is an inherent component of many trauma-focused treatments, including PE and Stress Inoculation Training. In-vitro techniques that rely on visualization (eg, EMDR) provide another viable delivery method.
4. *Relaxation exercises.* Aimed at addressing physiologic reactivity, these can include diaphragmatic breathing, progressive muscle relaxation, mindfulness, eye movements, and various other approaches, including simply bringing greater

awareness to the level of distress through routine use of a subjective distress measure.

5. *Psychoeducation.* This provides an understanding of why PTSD occurs and the underlying physiologic mechanisms and correlates, including the effects of trauma on neuroendocrine and autonomic nervous system regulation, and the strong association of PTSD with physical health effects. Tailoring psychoeducation to military and veteran populations is critical, because of the occupational context in which PTSD can occur and the fact that PTSD symptoms are rooted in skills and responses that are adaptive and beneficial in military occupational and war-zone environments.¹⁶

Complementary and alternative medicine approaches also have a role in augmenting evidence-based PTSD treatment, for example, through facilitating relaxation responses, helping with chronic pain or sleep, or facilitating narrative processes through expressive arts.²⁷

New Developments in Psychotherapy

In terms of new developments, 2 trauma-focused psychotherapies deserve particular consideration. The first is NET, which has been shown to be highly effective in severely traumatized populations and has even been delivered by lay counselors with only a few weeks of training.²⁸ Narrative exposure therapy has a solid evidence base, is within the A-level exposure therapy category in the VA/DoD CPG, is simple and straightforward in its approach, easy to learn, and specifically designed for multiple traumas, which can be very relevant to military and veteran populations. However, NET is almost never used by clinicians in DoD and VA facilities. In addition to offering it as a treatment option in DoD and VA mental health clinics, research is needed to explore the potential use of NET to reach veterans who do not engage in traditional care but may be willing to receive services in primary care or even nonmedical settings through peer-to-peer models.

Another trauma-focused therapy worth highlighting is Accelerated Resolution Therapy (ART), a form of eye movement therapy with similarities to EMDR, which offers promise in delivering clinically meaningful results within < 6 treatment sessions.^{29,30} Although ART has been tested in only 1 randomized clinical trial (RCT) to date, it incorporates the core elements of other trauma-focused therapies, which have an extensive evidence base.²⁹ Accelerated Resolution Therapy is highly pro-

cedural, relatively simple for clinicians to learn, and focused on addressing physiologic and emotional reactivity linked to intrusive traumatic images and memories. It involves imaginal and in-vitro exposure through visualization, relaxation techniques, combined with rescripting traumatic imagery, using techniques similar to those used in cognitive therapies for insomnia and nightmares (eg, Imagery Rehearsal Therapy). All of the procedures are grounded in lateral eye movements.

The 2-arm, DoD-funded RCT involved evaluation of ART for treatment of combat-related PTSD (average 3.7 sessions) against an attention control condition among 57 veterans. Significant differences at 3 months' follow-up were documented in PTSD, depression, anxiety, trauma-related guilt, sleep quality, and aggression.²⁹ Limitations of this study included reliance on the PCL rather than on a gold-standard diagnostic instrument, lack of independent blinded outcomes, and a control condition similar to a wait list. More rigorous RCTs with active control conditions, as well as dismantling studies, are needed. Nevertheless, the impressive reduction in PCL scores (averaging 17-20 points) after only 3 to 4 sessions and firm grounding in trauma-focused psychotherapy components was sufficient for clinicians at several military treatment facilities (including Walter Reed National Military Medical Center and Fort Belvoir Community Hospital) to become trained in this technique and begin offering it as an option to service members with PTSD. The popularity of this technique is likely to grow if more clinicians test it and confirm that rapid improvements in PCL scores and functioning are possible within a few sessions.

OTHER IMPORTANT CLINICAL CONSIDERATIONS

Ongoing clinical trials are actively looking at compressed delivery of CPT and PE psychotherapy (several sessions per week for 2-3 weeks), which will likely have considerable benefits in reducing patient dropout rates. Another active area of research involves interventions based in primary care, and there is good evidence to support expansion of step- and collaborative-care models in primary care to address postwar health concerns more holistically, particularly with regard to symptoms attributed to mTBI.^{4,7,24} Finally, considerable literature is emerging on conceptual problems with the overlap between mTBI and PTSD, problems of misattribution of generalized war-related health concerns to mTBI, and potential reinforcement of chronic postwar physical and cognitive

symptoms through the current structure of mTBI specialty care.^{4,7,24} All of this research strongly supports prioritizing interventions based in primary care.

SUMMARY AND CONCLUSION

The most clinically important development in PTSD is the new DSM-5 definition. Clinicians need to be thoroughly aware of the concerns with its clinical utility and have appropriate strategies for dealing with the clinical implications of discordant results (a prominent expert has even called for putting the new definition on hold).^{11,12} Treatment strategies likely to have the greatest impact on improving effectiveness of treatment are those that emphasize engagement and retention in care and most importantly, delivery of the core components of trauma-focused psychotherapy in a patient-centered manner.^{16,17} Promising developments in trauma-focused therapy include NET and ART. ●

Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

Disclaimer

The opinions expressed herein are those of the authors and do not necessarily reflect those of Federal Practitioner, Frontline Medical Communications Inc., the U.S. Government or any of its agencies, or Foundation House, Victoria, Australia. This article may discuss unlabeled or investigational use of certain drugs. Please review complete prescribing information for specific drugs or drug combinations—including indications, contraindications, warnings, and adverse effects—before administering pharmacologic therapy to patients.

REFERENCES

- United States Census Bureau. Veteran status: 2010 American Community Survey 1-year estimates. http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_1YR_S2101&prodType=table. Accessed February 27, 2015.
- Kok BC, Herrell RK, Thomas JL, Hoge CW. Posttraumatic stress disorder associated with combat service in Iraq or Afghanistan: Reconciling prevalence differences between studies. *J Nerv Ment Dis*. 2012;200(5):4.
- Norris FH, Slone LB. Epidemiology of trauma and PTSD. In: Friedman MJ, Keane TM, Resick PA, eds. *Handbook of PTSD: Science and Practice*. 2nd ed. New York, NY: The Guilford Press; 2004:100-120.
- Hoge CW, Castro CA. Treatment of generalized war-related health concerns: Placing TBI and PTSD in context. *JAMA*. 2014;312(16):1685-1686.
- Hoge CW, Terhakopian A, Castro CA, Messer SC, Engel CC. Association of post-traumatic stress disorder with somatic symptoms, health care visits, and absenteeism among Iraq war veterans. *Am J Psychiatry*. 2007;164(1):150-153.
- Thomas JL, Wilk JE, Riviere LA, McGurk D, Castro CA, Hoge CW. Prevalence of mental health problems and functional impairment among active component and National Guard soldiers 3 and 12 months following combat in Iraq. *Arch Gen Psychiatry*. 2010;67(6):614-623.
- Toblin RL, Riviere LA, Thomas JL, Adler AB, Kok BC, Hoge CW. Grief and physical health outcomes in U.S. soldiers returning from combat. *J Affect Disord*. 2012;136(3):469-475.
- Lester P, Peterson K, Reeves J, et al. The long war and parental combat deployment: Effects on military children and at-home spouses. *J Am Acad Child Adolesc Psychiatry*. 2010;49(4):310-320.
- Mansfield AJ, Kaufman JS, Marshall SW, Gaynes BN, Morrissey JP, Engel CC. Deployment and the use of mental health services among U.S. Army wives. *N Engl J Med*. 2010;362(2):101-109.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. Arlington, VA: American Psychiatric Association; 2013.
- Hoge CW, Riviere LA, Wilk JE, Herrell RK, Weathers FW. The prevalence of post-traumatic stress disorder (PTSD) in US combat soldiers: A head-to-head comparison of DSM-5 versus DSM-IV-TR symptom criteria with the PTSD checklist. *Lancet Psychiatry*. 2014;1(4):269-277.
- McFarlane AC. PTSD and DSM-5: Unintended consequences of change. *Lancet Psychiatry*. 2014;1(4):246-247.
- Headquarters, U.S. Department of the Army. Standards of medical fitness. Army Regulation 40–501. Washington, DC: U.S. Department of the Army; 2011.
- Friedman MJ, Hoge CW. Understanding changes to the posttraumatic stress disorder and acute stress disorder diagnoses in DSM-5. Presented at: Defense Centers of Excellence webinar; May 22, 2014. <http://www.dcoe.mil/Libraries/Documents/DCoE-May-2014-PH-Webinar-Presentation.pdf>. Accessed February 27, 2015.
- Veterans Health Administration, Department of Defense. *VA/DoD Clinical Practice Guideline for the Management of Post-Traumatic Stress, Version 2.0*. Washington, DC: Veterans Health Administration and Department of Defense; 2010.
- Hoge CW. Interventions for war-related posttraumatic stress disorder: Meeting veterans where they are. *JAMA*. 2011;306(5):549-551.
- Hoge CW, Grossman SH, Auchterlone JL, Riviere LA, Milliken CS, Wilk JE. PTSD treatment for soldiers after combat deployment: Low utilization of mental health care and reasons for dropout. *Psychiatr Serv*. 2014;65(8):997-1004.
- Lu MW, Duckart JR, O'Malley JP, Dobscha SK. Correlates of utilization of PTSD specialty treatment among recently diagnosed veterans at the VA. *Psychiatr Serv*. 2011;62(8):943-949.
- Spoont MR, Murdoch M, Hodges J, Nugent S. Treatment receipt by veterans after a PTSD diagnosis in PTSD, mental health, or general medical clinics. *Psychiatr Serv*. 2010;61(1):58-63.
- Harpaz-Rotem I, Rosenheck RA. Serving those who served: Retention of newly returning veterans from Iraq and Afghanistan in mental health treatment. *Psychiatr Serv*. 2011;62(1):22-27.
- Raskind MA, Peterson K, Williams T, et al. A trial of prazosin for combat trauma PTSD with nightmares in active-duty soldiers returning from Iraq and Afghanistan. *Am J Psychiatry*. 2013;170(9):1003-1010.
- Department of Veterans Affairs. CSP #563: Prazosin and combat trauma PTSD (PACT). <https://clinicaltrials.gov/ct2/show/results/NCT00532493?sect=X70156>. Updated July 28, 2014. Accessed February 27, 2015.
- de Kleine RA, Rothbaum BO, van Minnen A. Pharmacological enhancement of exposure-based treatment in PTSD: A qualitative review. *Eur J Psychotraumatol*. 2013;4:21626.
- Hoge CW, Jonas WB. The ritual of hyperbaric oxygen and lessons for the treatment of persistent postconcussion symptoms in military personnel. *JAMA Intern Med*. 2015;175(1):53-54.
- Krystal JH, Rosenheck RA, Cramer JA, et al; Veterans Affairs Cooperative Study No. 504 Group. Adjunctive risperidone treatment for antidepressant-resistant symptoms of chronic military service-related PTSD: A randomized trial. *JAMA*. 2011;306(5):493-502.
- Resick PA, Galovski TE, O'Brien Uhlmansiek M, Scher CD, Clum GA, Young-Xu Y. A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *J Consult Clin Psychol*. 2008;76(2):243-258.
- Hoge CW. Integrating evidence-based treatments for PTSD with CAM practices. *Psychiatr Ann*. 2013;43(7):338-339.
- Ertl V, Pfeiffer A, Schauer E, Elbert T, Neuner F. Community-implemented trauma therapy for former child soldiers in Northern Uganda: A randomized controlled trial. *JAMA*. 2011;306(5):503-512.
- Kip KE, Rosenzweig L, Hernandez DF, et al. Randomized controlled trial of accelerated resolution therapy (ART) for symptoms of combat-related post-traumatic stress disorder (PTSD). *Mil Med*. 2013;178(12):1298-1309.
- Kip KE, Elk CA, Sullivan KL, et al. Brief treatment of symptoms of post-traumatic stress disorder (PTSD) by use of accelerated resolution therapy (ART®). *Behav Sci*. 2012;2(2):115-134.