
Posttraumatic Stress Disorder Screening in the US Military and VA Populations

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Satan's Sandbox, by SFC Elzie Golden, courtesy of the Army Art Collection, US Army Center of Military History.

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2.1 Case

Upon return from their second 12 month deployment to Iraq in early 2006, all members of the deployed unit completed a Department of Defense mandated Post-Deployment Health Assessment. Among them was a 24 year old, single, Caucasian male who endorsed having experiences which replayed as nightmares, feeling numb or detached from others, and constantly being on guard within the past month. As a result of his answers, he was asked to meet with a primary care provider. During this meeting, he cited three incidents in which he and his unit members were engaged by the enemy including two improvised explosive devices and one small arms ambush. During those engagements, two of his fellow unit members were wounded and one close friend was killed. The soldier was given a referral to speak with a behavioral health provider who conducted an evaluation the next day. He was found to meet DSM-IV-TR criteria for posttraumatic stress disorder (PTSD). The soldier was then enrolled into the installation medical facility's behavioral health service and underwent treatment with a course of trauma-focused psychotherapy. After 6 months of treatment, the soldier's symptoms were significantly improved and the soldier continued to successfully serve in the military.

Conversely, a second soldier from the same unit denied any difficulties or mental health symptoms during his post-deployment screening process. By 6 months following his return home, this previously even-tempered married soldier with no history of disciplinary problems had ongoing marital problems, was under investigation for domestic violence against his wife, and was cited by local police for driving under the influence of alcohol. Ultimately, he was administratively discharged from the military for patterns of misconduct, an outcome which could have likely been prevented.

2.2 Background

Maintenance of medical readiness is a top priority for all commanding officers in the military. Medical readiness is a shared responsibility of military commanders, military medical personnel, and individual service members. They should work in an integrated manner to ensure that our military personnel are ready to fight and win our nation's wars while taking all practical measures to minimize the risk of harm to individuals and to the mission. Over the 14 year course of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), both commanders and the military health system (MHS) have primarily focused on treatment of symptoms and injuries following return from deployment, pre-deployment screening, and post-deployment screening. From a military mental health standpoint, common difficulties for service members have included PTSD, depression, traumatic brain injury, and substance misuse. OEF/OIF has involved unprecedented numbers of repeat deployments by service members and combat deployments by Guard and Reserve serve members; as these conflicts have continued, the impact on maintaining readiness has steadily increased [1–3]. The US Army alone has provided well over 1.5 million

troop-years to OIF/OEF between 2001 and 2011, more than all other US services combined [3]. Since 2008, the cumulative amount of time an individual soldier has spent deployed increased by an average of 28% [3]. The US Navy, Air Force, and Marine Corps have contributed 333,000, 309,000, and 280,000 troop-years to OIF/OEF from 2001 to 2011, respectively [3].

Epidemiologic studies estimate the current or 1-year prevalence of PTSD to be 3.5–5% for the general population over 12 months, 4–31% overall for military personnel returning from deployment, 13% for infantry personnel returning from deployment, and upwards of 30% for those seeking behavioral health care [4–9]. Rates of depression in similar populations have ranged from 3–25% [10, 11] and traumatic brain injury has been identified in 19% of the returning military personnel [12]. Service members with multiple combat deployments are at a higher risk of developing mental health problems than those deployed only once. Per the Office of the US Army Surgeon General, approximately 11.9% of the individuals returning from their first deployment will have mental health problems [13]. This number climbs to 18.5% with a second deployment, and 27.2% with a third or fourth deployment [13]. National Guard and Reserve personnel also appear to be at higher risk of mental health problems when compared to active-duty peers. Longitudinal assessment by Miliken et al found that 35.5% of the Guard and Reserve troops were at mental health risk 6 months after deployment compared with 27.1% of the active-duty soldiers [14].

From these statistics, it appears the majority of service members exposed to trauma do not develop PTSD. Additionally, many service members who develop PTSD are able to pass screenings and deploy repeatedly, suggesting that the natural course of PTSD is to improve over time, even without treatment. Studies which have followed PTSD over time have come to similar conclusions [15]. Those that do not improve over time, even with treatment, have a poorer prognosis; a general trend among long-term PTSD trajectory and medication studies is that individuals with greater chronicity of symptoms demonstrate lower responses to treatment than those treated early following the index trauma [6, 16–28]. It is for this reason that screening is so vital; those treated earlier after onset of symptoms are much more likely to be returned to duty while those caught late are far more likely to require medical retirement or significant limitations in duty. Essentially, the primary purpose of screening service members for PTSD is to catch the small percentage of service members who are more likely to be treatment-refractory and get them help before symptoms become chronic.

Many veterans receive care from the Veterans Administration (VA) at some point in their careers. Relatively few of these individuals receive VA care due to retirement from active duty after serving 20 years or more or being medically retired due to one or more chronic medical conditions [29]. The majority of veterans seeks out care after serving one or two tours of duty [30, 31]. Of these, a substantial portion do not access, delay to access, or fail to complete an adequate course of treatment while on active duty [31, 32]. All Veterans of OIF/OEF have been entitled to 2 years of free health care through the VA since 2001, and this was raised to 5 years of free care in the 2008 National Defense Authorization Act (NDAA) [33]. As of 2008,

40% of all the OIF/OEF veterans had enrolled with the VA [34] and 238,098 veterans received care through the VA [35]. Of these, 84,972 received new mental health diagnoses; 49,425 were new diagnoses of PTSD [35]. Given the impact of chronicity on treatment response for PTSD, it is clear that the VA faces a very difficult mission. VA treatment populations are comprised predominately of male veterans with chronic, treatment-refractory PTSD and a high percentage of comorbid conditions such as substance misuse [36]. Many experts feel that previously held distinctions between treatment response for men versus women and combat-trauma versus other traumas is better accounted for chronicity of symptoms in predominately male VA populations as opposed to anything unique about response to combat-trauma [36]. Unfortunately, no studies currently exist looking at these factors. Screening is less of a priority in this setting, though still important due to the proportion of service members who never seek out or receive treatment prior to enrolling with the VA.

2.3 History of Military/VA Screening

In 1991, nearly a quarter million US service members redeployed from Southwest Asia after participating in the Operation Desert Shield/Storm. At the time of their return they appeared healthy, but over the coming months to years reports emerged of illnesses and somatic complaints. This led to the development of large-scale epidemiological screening and special clinical programs to determine potential associated or causative factors; however, the lack of available deployment and post-deployment surveillance data served as a significant limitation to these efforts. In the wake of joint efforts by the Department of Defense, Department of Veteran's Affairs, and the Institute of Medicine, new guidelines were developed for post-deployment monitoring and management. In 1998, as part of the enactment of that protocol, the first Post-Deployment Health Assessment (PDHA) was introduced which included both a survey and a face-to-face interview and evaluation with a primary care provider [37].

Of note, the first PDHA contained a total of six questions of which only one focused on mental health (During this deployment have you sought, or intend to seek, counseling or care for your mental health?) [38]. Over the next 3 years, assessments conducted on personnel deploying to the Balkans allowed for refinement of the process and in 2001, the PDHA first included screening tools for depression (Patient Health Questionnaire-2) and PTSD (Primary Care-PTSD) [39, 40]. This process remained in place until 2006 when a second screening, called the Post-Deployment Health Re-assessment (PDHRA) was instituted.

The PDHRA, mandated as part of the 2005 National Defense Authorization Act, is required for all service members to complete 90–180 days after returning from a deployment [41]. This modification was based on initial studies in Afghanistan and Iraq veterans which showed that rates of service members with symptoms of PTSD increased after 90 days home [10, 14]. These studies also identified various barriers to care and stigmas about seeking mental health care which further influenced other mental health initiatives throughout the military and VA. During this time, multiple

other initiatives and changes were considered to the process to include having all returning service members complete a face-to-face evaluation with a behavioral health provider or undergo a full behavioral health intake evaluation, but studies did not support the anticipated benefit of those initiatives and the general process of completing the initial questionnaire and reviewing with a primary care provider has remained intact [42]. The one augmentation that most post-deployment screening stations did add was the presence of on-site or tele-available mental health providers to allow for initial completion of mental health referrals if indicated, though this was not a Department of Defense requirement [43].

In conjunction with the post-deployment screening, the prolonged requirements in Iraq and Afghanistan placed a demand on the all volunteer military for service members to participate in repeated deployments to combat zones. This led to concerns over deploying service members with mental health conditions and led to the creation of minimum mental health standards for deployment. Specifically, these standards required at least 90 days of treatment (usually medication) stabilization before deployment and specified medications which precluded deployment regardless of duration of treatment (e.g., lithium, antipsychotics, and tricyclic antidepressants). When coupled with a coordination of care process, these standards were shown to be effective in reducing the incidence of mental health complications [44].

Even with the myriad of changes as well as the addition of questions on drug/alcohol abuse and family violence, many service members with PTSD were not identified prompting Congress to require additional screening. In the 2012 NDAA, lawmakers increased the frequency of screening to the current schedule of 120 days before deployment, upon return from deployment, 90–180 days after deployment, 180–365 days after deployment, and 18–30 months after deployment [45]. Additional screenings are also conducted on entry into the VA health-care system and prior to separation from the military.

In conjunction with the post-deployment screening process, the US Army also implemented a primary care PTSD and depression screening process called Re-engineering Systems of Primary Care for PTSD and depression in the military known as (RESPECT-Mil) [46, 47]. As part of this process, which is now being adopted by Department of Defense widely, service members were routinely screened for depression and PTSD at each of their primary care patient encounters. If the service member screened positive, then they were assigned a nurse case manager who helped both to establish and maintain consultative communication between primary care and mental health services, and also monitor the service member compliance and health status. More recently, this process now includes the presence of a licensed behavioral health provider working directly in the primary care clinic to provide supportive counseling needs and assist in the care coordination. Those receiving treatment through these programs or receiving treatment in a traditional behavioral health setting are screened periodically to gauge progress (see *Basic Epidemiology and Important Limitations of all Screening Instruments* for more about the problems associated with using screening instruments as outcome measures) [46, 47].

Most recently, the Department of Defense has introduced the Behavioral Health Data Portal (BHDP). This automated system contains multiple screening protocols

which service members complete when attending their mental health appointments. The advantage of this system is that it is integrated throughout the military allowing for both a historical record of symptom scores and potential severity monitoring and it provides a standardized mechanism for assessment throughout the large, widespread military healthcare network. Through BHDP, patients complete screening questionnaires at each visit, which are immediately scored and saved. Data acquired through widespread use of this program may enable development of better instruments capable of being validated for repeated administration/gauging of symptoms over time [48].

2.4 Screening Tools

2.4.1 Basic Epidemiology and Important Limitations of All Screening Instruments

Effective screening requires appreciation of the general strengths and weaknesses of all screening instruments. An ideal screening instrument is simple to administer and grade, detects most of the cases of interest in a particular population (sensitivity), and does not cause the individual administering the test to be overwhelmed with false positives (specificity). While sensitivity and specificity are important in how an instrument functions, the most important consideration in screening is the predictive value which is driven largely by the prevalence of the condition in a given population. In most clinical situations, a lower cutoff score ensures the ability to detect most cases; however, since the prevalence of PTSD is generally low (<15%), most positive screening results will be false positives which may lead to a high number of unnecessary evaluations or referrals that could drain clinical resources away from higher priority needs. Determination of cutoff should take into consideration the purpose of the screening test, the estimated prevalence of PTSD in the population being screened, the predictive value and balance of false negatives and false positives, and the available clinical resources (4).

Another principal of psychometric testing that bears explanation is the difference between using an instrument for screening and using an instrument as an outcome measure. Many of the instruments for PTSD have been validated for screening purposes only, but are used as outcome measures by the military and VA. While these instruments appear to assess/quantify symptoms of a given disorder (face validity), scores obtained through repeated administrations become less reliable than those obtained on first administration [5, 49]. Screening instruments are validated in given populations for the ability to detect a condition when it is present. Detection involves an absolute cutoff score and answers the question “is the condition present?” Quantifying symptoms is inherently more labor intensive, requires more questions in order to more finely parse out symptoms, and involves clearly defined, symptom-based severity scales to grade severity to answer the question “to what degree is a condition present?” Adding a Likert scale to a patient-rated screening instrument questions does not turn a screening instrument into an outcome measurement. This

limitation is immediately apparent when an individual attempts to explain his/her symptom scores on an instrument such as the PTSD Checklist (PCL); inevitably, explanations for self-reported severity scores are inconsistent. Differences between rating a symptom as a 2 or a 3 are variable from person-to-person and in how an individual rates his or her symptoms at the time. One person's 2 for nightmares may signify nightmares every single night that he can now fall asleep after. Another's may be two nights a week which are impacted by severe nightmares which prevent further sleep that night.

Another important caveat for screening interpretation is that all screening instruments provide snapshots of a particular point in time and are easily overwhelmed by an individual's distress at the time of instrument administration. For example, an individual who has been deemed well-treated can appear to have significantly worsened if the instrument is administered right after his/her spouse asks for a divorce or the bank forecloses on his/her home. Symptoms are worse in the moment, but will return to baseline after the individual has come to terms with the stressor. This is clearly demonstrated in a study by Bodkin et al.; his group found that 78% of the non-traumatized respondents screened positive for PTSD on the structured clinical interview for DSM-IV (SCID) if they were asked to complete that section using "something they had been worrying about" [50]. Given that the SCID, one of our single best assessments for PTSD, was fooled so easily, every PTSD screen should be correlated with an individual's life circumstances before the score is accepted as valid. It also underscores that no single instrument is sufficient for making a diagnosis of PTSD on its own.

Lastly, recent studies highlight two key limitations of the current US military PTSD screening program. The first is that all of the large-scale screening programs are non-anonymous, self-report screening tools which rely on the individual service member to honestly report their symptoms. Warner et.al., showed that in a population undergoing immediate post-deployment screening, the majority of those who had mental health symptoms did not endorse those symptoms on the self-report screening. While this assessment has not been repeated in other time intervals, it does highlight the ongoing concern for the impact of stigma towards seeking mental health assistance [51]. Additionally, all of the current screening tools in place were developed based on the DSM-IV-TR criteria for PTSD, not the recent DSM-5 changes. A recent study by Hoge et.al., indicates that the change in criteria may not represent a clinical improvement compared to the DSM-IV criteria that has been largely unchanged for 25 years. [40] A new PCL version, based on DSM-5 (PCL-5) was recently developed, but is not in wide use.

2.4.2 Different PTSD Assessments

Gold Standard instruments for diagnosis and/or grading of PTSD symptoms include the SCID (diagnosis only), Clinician Administered PTSD Score (CAPS), Short PTSD Rating Interview (SPRINT), and PTSD Symptom Scale-Interview (PSS-I).

These assessments are based on standardized interviews and are impractical for large-scale screening, necessitating the use of self-report instruments.

Current US military deployment screening is conducted before and after deployment and consists of a combination of self-administered questions and a face-to-face evaluation by a primary care provider trained to administer these screenings [10, 14, 51]. Questions cover deployment location, general health, physical symptoms, mental health symptoms, and trauma exposure [10, 14]. The mental health section consists of questions related to PTSD, depression, suicidal ideation, aggression, and interest in receiving mental health care [10, 14]. Questions regarding depression and PTSD are drawn from instruments commonly used in primary care, including the Patient Health Questionnaire-2 (PHQ-2) for depression and the Primary Care PTSD screen (PC-PTSD). Following completion of screening, the service member is interviewed by a credentialed physician, nurse practitioner, or physician assistant to determine if referral is required [10, 14]. Mental health personnel are often present as well to provide emergency care if the service member endorses suicidal or homicidal ideation and to assist high risk individuals with obtaining follow up if needed [10, 14, 44].

The majority of military PTSD screening is done using the PC-PTSD. The PC-PTSD contains four questions related to the major PTSD symptom clusters of re-experiencing, avoidance, hyper-vigilance, and emotional numbing [52]. Following a positive screen with the PC-PTSD, the PCL is often administered. Three very similar versions of the PCL, based on DSM-IV criteria, have been used, the military version (PCL-M), the civilian version (PCL-C), and the specific stressor version (PCL-S). A new PCL version, based on DSM-5 (PCL-5) was recently validated, but is not in wide use. The PCL consists of 17 questions related to DSM-IV criteria for PTSD as well as a Likert scale to assess symptoms severity, ranging from 1 (not at all) to 5 (extremely) [52]. Specific score cutoffs vary depending on the purpose of the test and population being tested.

The PC-PTSD and the PCL have been validated for screening in civilian populations, the US soldiers, and veterans in the VA system seen in primary and behavioral health care [4, 49, 52–54]. The PCL has also been widely used by military services from other countries. Alternate versions of the PCL have been validated for multiple civilian trauma types [55] and subpopulations such as geriatric primary care patients [56], Brazilian first responders [57], and Sri Lankan military [58]. As alluded to above, evidence suggests that self-report instruments such as the PC-PTSD and PCL may not be as accurate over time. Neither of these were validated for repeated administration.

In a 9-month study with serial administration of the PCL, Forbes et al. found significant variations in accuracy of the PCL in determining presence and severity of individual symptom at each time point. As symptoms improved and approached minimum PTSD symptom criteria, the PCL demonstrated reductions in diagnostic accuracy [49]. Forbes et al. concluded that the PCL underrated improvement when compared against the clinician administered PTSD scale (CAPS). Although Monson et al. found that the PCL remains sensitive to symptom change over time [59], the potential for diminished accuracy is concerning as the PC-PTSD and PCL are

built into most all of the current US military PTSD screening programs including the Behavioral Health Data Platform and all of the primary care centered programs.

Another presumptive weakness of the PC-PTSD and PCL is the overlap of PTSD symptoms with other mental health conditions. Studies of a similar instrument, the Davidson Trauma Scale (DTS), found a drop in sensitivity of 30–40% when comorbid depression or another anxiety disorder was present [5]. In populations with large prevalence of comorbid disorders (e.g., military and VA populations), the PCL-S appears more optimal due to being anchored to a single traumatic experience, [60] and the PCL-S has been widely used in prevalence studies in military populations [7, 30, 61]. The new PCL-5 is also anchored in the same way as the PCL-S.

Other PTSD screening instruments widely used outside of the US military include the DTS, PTSD Symptom Scale—Self-Report (PSS-SR), and Harvard Trauma Questionnaire (HTQ). The DTS is similar to the PCL-M/PCL-C. Both share a 17-item structure tied to DSM-IV criteria with a 5-point Likert severity scale, demonstrate similar sensitivities and specificities, have been validated for use in US military and veteran populations, and are presumably equally nonspecific in differentiating between comorbid axis I disorders as the PCL [5, 62]. Like the PCL-S, the DTS is anchored to a single trauma [5]. It is widely used in PTSD medication research and appears in a few psychotherapy studies as well. The DTS was found to be sensitive to changes in selective serotonin reuptake inhibitor (SSRI) trials by its creator, Dr. Jonathan Davidson, when he analyzed his own medication trials [63]. However, due to the similarities with the PCL, the DTS likely demonstrates comparable performance overall.

The PSS-SR is a third 17-item questionnaire closely tied to DSM criteria with a 3-point Likert scale accompanying each symptom [64]. It is not widely used in the American or European studies and is not validated in the US military or veterans based on our literature search. The HTQ is a narrative-based assessment tool applied to an open-ended conversation. In a recent study of Iraq refugees, it took roughly 1 h to administer as well as time spent translating recorded responses [65]. Given its length and difficulty in administration, it is not widely used in research or clinical practice and is not validated for use in the US military or veterans.

2.4.3 Recommended CutOff Scores

Use of the PC-PTSD is fairly straightforward given its short length. It is generally agreed that a score of 2 or greater demonstrates sufficient sensitivity and specificity to be considered positive, though three or greater is sometimes used when greater specificity is sought [53]. This is a general screening tool and high rates of false positives are found when this tool is used for general population screening [4].

As referenced in our epidemiologic discussion, no single PCL cutoff is adequate for all purposes [4]. For research studies of PTSD prevalence in most general populations (where prevalence is expected to < 15%), higher specificity cutoffs (e.g., 48 or higher), are necessary to ensure that estimates are not grossly inflated; for screening in a clinical setting where every individual will be receiving a clinical evaluation, a lower cutoff (33–44) is preferred to reduce the number of false negatives [4]. This recommendation is contrary to guidelines from the National Center for PTSD which recommend the highest PCL cutoff scores be reserved for settings where

prevalence is highest (e.g., >40% prevalence in a VA mental health clinic). Terhakopian et al. provides an excellent illustration of the need for calibration in cutoff scores depending on the expected prevalence and clinical setting. In a population of returning veterans with a PTSD prevalence of 15%, for example, a PCL cutoff of 30, which has been validated for use in clinical settings and estimated to have a sensitivity of 0.85 and specificity of 0.73, produces a prevalence estimate of 36% (and a corresponding percent of the population needing clinical evaluation). This is more than double the actual prevalence, due to high numbers of false positives and low predictive value, [4] and can also potentially overwhelm mental health resources conducting clinical evaluations. If the cutoff is increased to 50, sensitivity decreases to 0.54 and specificity increases to 0.93 [4]. This results in nearly half of individuals with PTSD (46%) being missed, but produces a prevalence estimate that is much more accurate (14%). For the purpose of screening, clinical setting and clinical resources must be taken into consideration in when selecting appropriate cutoffs. Epidemiological studies of prevalence must utilize higher cutoffs, while screening in clinical settings must take into consideration an appropriate balance of identifying as high a number of individuals who have the disorder as possible while also not overwhelming clinic resources and the capacity to evaluate those who screen positive. One concern is that test performance may not be as reliable in the presence of comorbid conditions, and PCL results should be interpreted with caution in individuals with depression or other anxiety disorders. In terms of other instruments, the DTS appears to have no clear advantage over the PCL, though DTS validation studies are difficult to interpret because of subgroup analyses that limit accurate comparisons with PCL studies [5].

2.5 Future of PTSD Screening

The largest limitations of current screening programs is reliance on self-report data, which is impacted by concerns of a lack of anonymity due to stigma and appears to diminish in accuracy over time and as individuals improve [5, 49]. Use of standardized interview-based assessments such as the Clinician Administered PTSD Scale (CAPS), the Short PTSD Rating Interview (SPRINT), or the PTSD Symptom Scale—Interview (PSS-I) is impractical due to the time and special training required to administer each. To address this, a current research focus is the identification of potential biomarkers for PTSD, particularly early in its clinical course when it is most responsive to treatment [66–68]. Though still in its infancy, several potential markers such as p11 in peripheral blood cells and glucocorticoid receptor numbers have demonstrated potential utility in differentiating PTSD from other psychiatric conditions in humans, but not to the degree that they can be relied on clinically [67, 68]. Cortisol and inflammatory markers are also being studied, though their role in PTSD is very complex and variable [69, 70]. Should a viable biomarker for PTSD be identified, it would likely change the military's screening policies dramatically.

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