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Imagery Rehearsal Therapy: An Emerging Treatment for Posttraumatic Nightmares in Veterans

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Nightmares are a common complaint among service members exposed to traumatic events, but prevailing paradigms are disposed to a view that nightmares are a secondary phenomenon untreatable with direct therapeutic intervention. Imagery rehearsal therapy is a cognitive-imagery approach with proven efficacy in the treatment of nightmares in civilian trauma victims. Imagery rehearsal therapy not only has potential to reduce nightmare intensity and frequency, but controlled studies show clinically meaningful decreases in all clusters of posttraumatic stress disorder symptoms as well as insomnia. Limited data support its use with combat veterans. Directions for future research with combat veterans are recommended.

Keywords: Imagery Rehearsal Therapy, veterans, nightmares, sleep disorders

Nightmares are an extremely common occurrence in both clinical and healthy populations with a lifetime incidence rate likely near 100%. Previous studies have shown that between 8 and 25% of adults report at least one nightmare per month (Belicki & Belicki, 1982, 1986; Feldman & Hersen, 1967; Levin, 1994; Wood & Bootzin, 1990) whereas 4 to 8% report at least one nightmare each week (Nielsen & Zadra, 2000).

Increased prevalence of nightmares has also been found in those exposed to a wide range of traumatic experiences (Barrett, 1996; Lifton & Olsen, 1976; Low et al., 2003) particularly those suffering from posttraumatic stress disorder (PTSD; Kilpatrick et al., 1998; Krakow, Melendrez et al., 2002; Ross, Ball, Sullivan, & Caroff, 1989). As expected, nightmares are a common complaint among military personnel because of exposure to traumatic experiences, often times on multiple occasions (Neylan et al., 1998).

Generally, in the trauma literature, nightmares are viewed as a re-experiencing symptom of PTSD or acute stress disorder (ASD) (*DSM–IV*, American Psychiatric Association, 2000; Kilpatrick et al., 1998). In the past two decades, clinical interest has developed regarding the impact of nightmares on PTSD morbidity and on nightmare treatments. Still greater interest is emerging about nightmare effects and treatment in the wake of increased incidence of PTSD and nightmares in active duty and veterans of military operations since 2002 (Moore & Krakow, 2009).

Competing Perspectives on Posttraumatic Nightmares

There are four major perspectives on chronic nightmares and their treatment that receive attention in the scientific literature. The two models that have been most researched or widely discussed are the traditional psychodynamic model of nightmares (Lansky, 1995) and the formulation of nightmares as a symptom of PTSD (*DSM–IV*, American Psychiatric Association, 2000). A third psychopharmacological model has a long-track record of mixed results (Maher, Rego, & Asnis, 2006), but it now has gained recognition because of recent developments with the drug Prazosin, an antihypertensive medication serendipitously found to reduce nightmares in PTSD patients (Krystal & Davidson, 2007; Raskind et al., 2007; Raskind et al., 2003). The last albeit emerging model of nightmare assessment and treatment is described as either "nightmares as a sleep disorder" or "nightmares as an independent sleep disorder comorbid with PTSD" (Kellner, Neidhardt, Krakow, & Pathak, 1992; Krakow & Neidhardt, 1992; Neidhardt, Krakow, Kellner, & Pathak, 1992).

It is clear that traditional models of nightmares (psychodynamic or PTSD-driven) presume that nightmares are secondary phenomenon requiring treatment of the primary condition that caused the nightmares; whereas, the more recent models (pharmacologic or sleep disorder) explicate nightmares as a directly treatable condition. For additional reading on the psychodynamic model of nightmares, the reader is referred to Lansky's (2008) recent book, for nightmares as a symptom of PTSD, there are numerous works cited in the *DSM–IV* (American Psychiatric Association, 2000), and for psychopharmacological treatments, the works of Raskind are essential reading. Phelps et al. (2008) has also conducted a recent review and thoughtful discussion on some aspects of these models along with an attempt to precisely codify the various types of dream experiences reported by trauma survivors.

Treatment-wise, the conventional wisdom on nightmares is that they are a sign of deeper emotional turmoil or conflict for which appropriate psychotherapies for the emotional issues would be expected to decrease nightmare frequency and intensity. Another symptomatic view of nightmares emerges from cognitive–behavioral therapy that posits nightmares as a secondary element of PTSD responsive to exposure therapy for PTSD without directly targeting the disturbing dreams.

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In our clinical experience, variations on these perspectives reflect the most widely held belief in the fields of psychology and psychiatry. For example, when we engage with therapists who treat PTSD patients, whether civilian or military, virtually all practitioners support the view that nightmares are best appreciated as a symptom and therefore not something to target for direct treatment. The notion that direct nightmare treatment is possible is not necessarily dismissed, but it is rarely embraced.

Regarding Prazosin, it does appear to target nightmares directly in both civilian and military populations, but all available studies on the medication seem to point to recidivism when the medication is discontinued (Raskind et al., 2003). Thus, Prazosin is a direct treatment, yet apparently it only provides "symptomatic" relief and not an actual cure for nightmares in contrast to the two more traditional models.

The Emerging Model of Nightmares as a Sleep Disorder

The view of nightmares as an independent sleep disorder is relatively new to the literature. Research strongly implicates that nightmares cause their own morbidity through impairment of sleep or through direct stimulation effects, and they also appear to influence more specific parameters of sleep (Krakow, Tandberg, Scriggins, & Barey, 1995). For example, in a controlled comparison of nightmare and non-nightmare sleep patients, nightmares were strongly associated with greater insomnia severity including fear of going to sleep, difficulty falling asleep, difficulty staying asleep and difficulty returning to sleep if awakened. Poor sleep quality is routinely found in nightmare sufferers, and remarkably, very recent studies suggest that nightmare sufferers show a high prevalence of sleep-disordered breathing (Krakow et al., 2004; Krakow et al., 2001; Krakow et al., 2006).

In addition, research links nightmares with other mental illness. Several studies have shown nightmares as a risk or in association with suicidality (Bernert & Joiner, 2007; Bernert et al., 2005; Sjöström, Hetta, & Waern, 2009), depression (Agargun et al., 2007; Besiroglu, Agargun, & Inci, 2005; Cartwright, Young, Mercer, & Bears, 1998), and PTSD (Krakow et al., 2001; Neylan et al., 1998; Rothbaum & Mellman, 2001).

Taken together, curiosity has been piqued on whether or not nightmares should be viewed as a specific problem requiring direct treatment distinct from other treatment paradigms for those comorbid conditions in which nightmares frequently arise, or whether to continue focusing treatment on the so-called primary causative factors. In Phelps and colleagues review (Phelps et al., 2008), there is some reconciliation of these models in that there may be a normal or functioning form of traumatic nightmare (typically more symbolic than replicative) that leads to emotional recovery in contrast to replicative or replay-like nightmares that appear to have no obvious function other than to trigger spiraling cycles of PTSD symptoms.

The question would arise then as to which type of therapeutic approach would yield the most benefits. For example, would exposure therapy for specific nightmares or PTSD be the superior approach for replay like dreams because these replays operate like a classic re-experiencing symptom? And, would a psychodynamic or dream interpretation therapy work well with symbolic nightmares, because these dreams suggest that emotional processing is already underway? Still a third option would be the use of imagery rehearsal therapy (IRT), a cognitive-imagery technique that directly targets nightmares of various types. However, according to the two traditional models, IRT should not work when nightmares are a secondary symptom while the primary cause is left untreated. In the worse case, IRT should lead to symptom substitution for failing to treat the primary condition.

The Concept of and Research on Residual Nightmares Post-PTSD Treatment

Among a small group of sleep researchers, there has been a growing concern about the lack of interest in sleep outcomes following PTSD treatment. Spoormaker and Montgomery's (2008) excellent review highlights this concern through his evaluation of Bisson and colleagues (2007) meta-analysis of 38 randomized controlled trials demonstrating the superiority of cognitive–behavioral treatments for PTSD. Of 38 RCTs, only six studies reported sleep outcomes (only two measured insomnia and nightmares) despite the fact that both nightmares and insomnia are two criteria among 17 criteria for the diagnosis of PTSD. The sleep data gathered in five of the studies were sparse, showed only modest or inconsistent effects posttreatment, and the improvements in PTSD outcomes were noticeably greater than improvements in sleep. The 6th study used IRT.

Spoormaker and Montgomery (2008) concluded "the evidence suggests that sleep disturbances are not simply reduced by standard psychological therapy for PTSD. . ." and ". . .sleep disturbances may develop into separate disorders during the course of PTSD." Among sleep researchers, the emerging perspective is that insomnia and nightmares may persist after PTSD-focused therapy for PTSD patients. Yet, to our knowledge, there is no extensive commentary in the scientific literature in general or the trauma literature in particular that adequately explains this phenomenon. Conceivably, weak or poorly delivered PTSD treatments might account for residual nightmares. In juxtaposition, we also find sparse commentary in the trauma literature on the possibility of nightmares as a comorbid condition for which PTSD treatment may or may not provide definitive care. Clinically, in our treatment of hundreds of chronic nightmare patients with PTSD or traumatic exposure, well over 80% of individuals receiving IRT reported they received some form of psychotherapy or pharmacotherapy for PTSD before seeking treatment for chronic nightmares at one of our sleep medical centers or sleep research programs.

Ironically, one might argue that having treated PTSD, the posttreatment presence of residual nightmares suggests that the primary or comorbid condition (i.e., a nightmare disorder) was not properly addressed. Further, having incompletely treated the patient, it could be argued that "symptom substitution" has occurred; that is, nightmares persist because the primary condition of nightmares was neglected in favor of the treatment of PTSD. We say ironic because this reasoning (in reverse order) is identical to that used to dismiss the direct treatment of nightmares: nightmares are secondary, therefore focusing on their treatment will lead to incomplete therapy and resultant symptom substitution. Or, if the disturbing dreams were treated in isolation, positive results at best would be temporary.

To paraphrase the old medical adage, "apparently nightmare patients receiving direct treatment forgot to read the textbook,"

because the earliest controlled studies on the treatment of chronic nightmares have shown striking effects: treat nightmares independently and various symptoms decrease, most notably anxiety and depression (Kellner, Neidhardt, Krakow, & Pathak, 1992; Krakow, Kellner, Neidhardt, Pathak, & Lambert, 1993; Neidhardt, Krakow, Kellner, & Pathak, 1992); and, more recent studies have shown decreases in posttraumatic stress symptoms following successful nightmare treatments. In a seminal study, initiated in 1994 and published in 2000 and 2001, IRT not only decreased nightmare frequency, but also PTSD symptoms dropped dramatically in a randomized controlled study of 114 sexual assault survivors with long-standing and moderately severe conditions (Krakow et al., 2000, 2001). Notably, changes were similar across all three symptom clusters of PTSD, and global PTSD effect sizes were similar to changes noted in controlled studies of Sertraline, a first-line medication for PTSD (Davis, English, Ambrose, & Petty, 2001). Subsequently, IRT has emerged as a possible or recommended first-line treatment for chronic nightmares according to seven published review articles since 2003 (Harvey, Jones, & Schmidt, 2003; Lamarche & De Koninck, 2007; Lancee, Spoormaker, Krakow, & van den Bout, 2008; Maher, Rego, & Asnis, 2006; Spoormaker & Montgomery, 2008; Spoormaker, Schredl, & van den Bout, 2006; Wittmann, Schredl, & Kramer, 2007).

In summary, all four models for posttraumatic nightmares have merit and proven efficacy of varying degrees. Clinically, individual attention to specific patients would likely address which approach is best suited for each patient. And, in some cases, direct nightmare treatment could be used simultaneous to or sequential with other PTSD treatments.

As all these therapeutic paradigms relate to practitioners involved in the rehabilitative care of military service members, it is a certainty that a large proportion of patients with nightmare complaints will present for treatment. Of clinical import, the overwhelming majority of nightmare sufferers neither seek treatment for this specific condition nor do they imagine that a direct treatment exists for the condition (Krakow, 2006). In our view, an understanding of effective and efficient direct treatment methods for the treatment of nightmares is useful for those that are in the position to provide therapy to service members; and the remainder of this article will provide brief details and suggestions on the use of IRT, which to date has only been tested in a small number of studies in military personnel. As above, the reader is referred to other resources covering the three other nightmare treatment modalities.

IRT

IRT has a number of variations that have been reasonably well-described in the literature, some dating back to 1934 (Wile, 1934). Our model is a two-factor cognitive–behavioral treatment applied individually or in group format. The first factor views nightmares as a learned behavioral disorder, such as the sleep disorder insomnia; and the second factor posits that nightmares find fertile ground among individuals with damaged, disabled, or malfunctioning imagery capacity (Krakow & Zadra, 2006).

The most common variations of IRT relate to the number of sessions, duration of treatment, and the degree to which exposure therapy is included in the protocol. A comprehensive model has been put forth by Krakow and Zadra (2006) that includes four group treatment sessions, ~2.25 to 2.5 hr in length. The first two sessions focus on how nightmares are closely connected to insomnia and how they become an independent symptom or disorder that warrants individually tailored and targeted intervention. The last two sessions focus on the imagery system and how IRT can reshape and eliminate nightmares through a relatively straightforward process akin to cognitive restructuring via the human imagery system. First, the patient is asked to select a nightmare, but for learning purposes the choice would not typically be one that causes a marked degree of distress. Second, and most commonly, guidance is not provided on how to change the disturbing content of the dream; the specific instruction developed by Joseph Neidhardt is "change the nightmare anyway you wish" (Neidhardt et al., 1992). In turn, this step creates a "new" or "different" dream, which may or may not be free of distressing elements. Our instructions, unequivocally, do not make a suggestion to the patient to make the dream less distressing or more positive or to do anything other than "change the nightmare anyway you wish." Last, the patient is instructed to rehearse the "new dream" through imagery and to ignore the old nightmare.

In summary, this version of IRT draws patients into a discussion of nightmares as a learned behavior similar to insomnia, then educates patients on the nature of the human imagery system with respect to dreams and waking images, and finally provides the 3-step instruction to select a nightmare, change the nightmare, and rehearse the new dream. Overall, IRT seeks to minimize exposure elements in the protocol.

Numerous controlled studies have shown IRT to be effective in reducing nightmare frequency, intensity and associated distress, while maintaining positive outcomes (Kellner et al., 1992; Krakow et al., 1993; Neidhardt et al., 1992). It has also been shown to be effective with nightmares specific to PTSD (Krakow et al., 2002; Krakow, Hollifield et al., 2001; Krakow, Johnston et al., 2001; Krakow, Kellner, Pathak, & Lambert, 1995; Neidhardt et al., 1992).

Long-term follow-ups though uncontrolled have shown dramatic results for maintenance of effects. In at least two studies that surveyed patients at 18 months (Krakow et al., 1996) and 30 months (Krakow et al., 1993) posttreatment with IRT, nightmare reductions were maintained or further improved upon. Thus, from this growing body of research in civilian populations there is a reasonable degree of evidence to support the model that nightmares are an independent sleep disorder comorbid with PTSD, which can be directly treated with a specific nightmare therapy known as IRT. However, the data on IRT in military populations reveals fewer studies, smaller samples, and somewhat less robust effects, raising the question as to whether nightmares in military personnel with PTSD will respond to IRT and whether nightmares are functioning as an independent sleep disorder in this population.

Use of IRT With Veterans

Although there is substantial research supporting the use of IRT with trauma victims, the vast majority of research exploring the efficacy of IRT in the treatment of posttraumatic nightmares has involved victims of crime and natural disasters. Only a few studies have investigated the effectiveness of IRT in treating combat-related nightmares in service members.

Forbes, Phelps, and McHugh (2001) conducted a pilot study examining the effectiveness of IRT in treating combat-related nightmares of 12 Vietnam veterans diagnosed with PTSD. Three treatment groups consisting of four veterans in each group received a series of six weekly sessions lasting 1.5 hr each. The data reflected significant reductions in nightmares as well as global PTSD symptoms up to 3 months posttreatment. It should be noted that there were significant limitations to this study including a small sample size and an inability to infer positive outcomes to the therapeutic intervention because of the uncontrolled design. However, the authors' concluded that a randomized controlled trial was warranted based on the preliminary data from the pilot study.

In a 12-month follow-up study on the same veterans, results showed that gains continued with regard to nightmares and PTSD indicating long lasting treatment effects (Forbes et al., 2003). Specifically, the number and intensity of nightmares improved as did depression, anxiety, and overall PTSD symptoms. The cautions in interpretation remain, particularly factors such as spontaneous improvement, life factors impacting improvement, and other treatments that the participants may have received during the 12 month period.

Of clinical interest regarding the two studies above, the authors' protocol included an instruction regarding the change process: after the veteran selected a nightmare, he was asked to write it down and share it with the group. This was done to allow the group to help the veteran create a more palatable and nonthreatening dream alternative. However, this step creates an element of exposure, which in theory could be responsible for the positive outcome. This criticism is not unlike that seen with Eye Movement Desensitization and Reprocessing as many critics believe that exposure is the key element to improvement as opposed to dual stimulation via eye movements, taps, or tones (Lilienfeld, 2008; Lohr, Lilienfeld, Tolin, & Herbert, 1999). In the model described by Krakow and Zadra (2006), participants were instructed not to dwell on or rehearse the nightmare, but rather choose a "new dream" to replace it. Although it is unlikely that exposure is completely removed from the most widely tested form of IRT, it is kept to a minimum and unlikely to be responsible for positive results in studies that include this qualifier.

A second important variable in the two studies mentioned above is the issue of dream scenarios provided to the patient by group members. This approach potentially limits acceptance of the chosen dream when the patient doesn't resonate with it for whatever reasons. In theory, this ambivalent response could have a negative impact on treatment outcome.

A more recent study by Moore and Krakow (2007) found that IRT was associated with significant reductions in nightmare intensity and frequency, insomnia severity, and global PTSD symptoms in a case series of 11 soldiers suffering from acute (within 30 days) posttraumatic nightmares in Iraq. The comprehensive group format originally described by Krakow and Zadra (2006) and a training manual (Krakow & Krakow, 2002) were adapted to an individual format, and material was changed to reflect the unique needs of soldiers deployed to a combat environment who were treated shortly after the onset of a nightmare problem.

The first session focused on how IRT does not require the individual to discuss or relive the original traumatic event or traumatic content of the nightmares. As mentioned earlier, exposure is not a necessary component of this treatment approach. Education about nightmares, insomnia, and sleep hygiene were provided as was education on the differences between combat stress, acute stress reaction, and PTSD. The second session consisted of familiarizing the service member with the concept of nightmares being a learned behavior, assistance with imagery training and practicing of imagery within the session. The third session consisted of assisting the service member in selecting a nightmare to change, changing the nightmare to a "new dream," and practicing the new dream in the mind's eye. The final session focused on developing a plan to practice newly learned imagery skills in the deployed setting and how to confront new nightmares that may occur once treatment is terminated. For a more detailed review of how IRT can be adapted with service members see Table 1 in this article and Moore and Krakow, 2009.

Although promising, this case series was limited by the small number of individuals in the series as well as the fact that a sizable proportion of individuals experience a natural remittance of posttraumatic nightmares within the first days or weeks after a triggering event. Therefore, we could not determine how many of these service members would have improved without intervention.

The most recent study utilizing IRT with veterans was conducted by Lu and colleagues (2009). In this uncontrolled study of 15 male veterans with PTSD and trauma-related nightmares, results showed no immediate improvement posttreatment; however, 3 month follow-up showed a decrease in nightmare frequency and improvement in PTSD symptoms. Participants in the study had not undergone exposure-based therapy for PTSD, and several participant's reports of aversion to trauma-focused treatments led the authors to posit that veterans naïve about trauma-focused therapy may not be ideal candidates for this approach.

It's important to note that Lu and colleagues (2009) utilized the same protocol as the study by Forbes, Phelps, and McHugh (2001).

Table 1
Adaption of IRT With Military Personnel in Deployed Setting

Session 1
Emphasize that IRT does not discuss past traumatic events or traumatic content of nightmares
Education about nightmares, insomnia, and sleep hygiene
Discuss treatment expectations and higher levels of care in a combat environment
Discuss risks unique for soldiers with nightmares (safety, mission focus, PTSD)
Discuss differences between combat stress, acute stress reaction, and PTSD
Session 2
Discuss why nightmares persist after combat stressor
Discuss nightmares as a learned behavior and as a normal response
Educate on basic principles of imagery and how to apply in a war zone
Teach how to access personal imagery skills
Practice personal imagery
Learn about the potential for change from "nightmare sufferer identity" to a "good dreamer identity"
Session 3
Develop plan for regular use of IRT for nightmares
Select a nightmare
Change the nightmare to a "new dream"
Rehearse the new dream
Session 4
Explain how to manage new nightmares that may occur
Explain paths for follow-up care in the combat environment and at home

Consequently, the element of exposure was present, which potentially explains the aversion to the trauma-focused nature of their protocol. Exposure-based therapy requires significant preparation between therapist and patient to prevent resistance to treatment. It's possible that this resistance would have not been present if exposure was minimized as recommended by Krakow and Zadra (2006).

Benefits of Utilizing IRT With Military Personnel

IRT has the potential to be a very successful and prominent treatment for nightmares in military personnel for several reasons. First, IRT is a short-term and evidence-based treatment that is consistent with the current focus in the military on brief and tested psychological interventions for service members. Short-term and evidence-based treatments are important because of the fact that long-term care with service members is often times difficult. Active Duty military personnel maintain hectic and unpredictable training and deployment schedules, which impacts their availability for mental health appointments. National Guard and Reserve members are processed and returned home shortly after returning from deployment. Therefore, short-term, effective treatments help maximize the service member's time spent in treatment and ensures that some level of care is provided. In addition, as has been shown by Moore and Krakow (2007), IRT can be utilized in a deployed environment. In no other setting is quick and targeted psychological intervention more important. Furthermore, similar to relaxation and some cognitive techniques, IRT is mobile and service members can utilize this method at more remote and austere bases in deployed settings where appropriate mental health professionals may not be available.

Another potential benefit of using IRT with military personnel is related to the proactive nature service members have in generating effective solutions to difficult problems. Service members are trained to identify problems, generate solutions, and implement those solutions until the problem(s) is resolved. IRT is a treatment that places a substantial degree of personal responsibility on the patient and complements those with a high internal locus of control and increased levels of motivation. Considering that IRT is most effective with consistent application outside of the therapy session, military personnel are ideal candidates for this treatment approach. They are more likely to apply the treatment until resolution occurs or work with the clinician to fine-tune the technique.

Because of the stigma regarding mental health treatment in the military (Hoge et al., 2004), service members may be more apt to consider treatment for nightmares as opposed to PTSD. As has been noted previously, treating nightmares independently as well as irrespective of other PTSD symptoms or treatments improves not only nightmares, but insomnia and posttraumatic stress as well. However, we are not advocating IRT as a replacement for other exposure and cognitive based treatments for PTSD. IRT can be used as a starting point with service members, who in receiving relief from their nightmares and sleep disturbances, subsequently increase the likelihood of follow-through with more general treatment of PTSD.

Last, IRT appears effective in individual (Moore & Krakow, 2007) and group (Lu et al., 2009) settings with veterans, albeit randomized controlled studies are required for both clinical scenarios. The former allows clinicians to use IRT as a monotherapy when targeting nightmares specifically. The latter provides clinicians the opportunity to use IRT as an adjunctive therapy for service members undergoing individual therapy for PTSD but who suffer refractory nightmares. The latter also allows busy clinicians, such as seen in veterans affairs and military medical centers, to maximize their time and provide care to as many service members as possible.

Future Directions for Research With IRT in Veterans

Based on the emerging data on the use of IRT in service members suffering from posttraumatic nightmares, we believe that further examination of this treatment with this population is warranted. Possibilities for future inquiries include comparing the effectiveness of IRT with other cognitive–behavioral based therapies. Specifically, randomized controlled trials comparing IRT with prolonged exposure and cognitive processing therapy would likely prove beneficial, particularly with regard to assessing impact on nightmares and in measuring adherence to the programs. Exploring the potential of IRT to provide additional positive effects when combined with primary treatments for PTSD would also be useful.

Other lines of possibly inquiry include dismantling studies investigating the essential and nonessential elements of the treatment and clarification on best practices. Two areas in particular are worth mentioning. How much exposure should or not be embedded in an IRT program? And, regarding the process of selecting and changing the nightmare, what type of instruction—"changing the nightmare anyway you wish" versus "group-directed recommendations"—is best suited to which types of nightmare patients.

Conclusion

IRT shows some promise in treating service members suffering from posttraumatic nightmares. Data support the potential for IRT in reducing global PTSD symptoms as well as insomnia in certain populations; however, testing in military personnel is needed, and it is our understanding that several IRT studies are either underway or currently in development at various military installations around the United States.

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