Integrative Medical Practices for Combat-Related Posttraumatic Stress Disorder

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The discrepancy between military and civilian prevalence rates of posttraumatic stress disorder (PTSD) indicates that military service, in particular combat duty, carries with it an increased risk for the development of PTSD, thereby representing one of the key challenges to military mental health care. The US Department of Defense (DoD) has experimented with incorporating integrative medicine practices into a variety of PTSD treatment centers. Much of the pioneering work started with the Warrior Resilience Center in Fort Bliss, TX, during the early years of the war in Iraq. Though it is an outpatient program, the Warrior Resilience Center should be acknowledged as a model for the two intensive residential programs recently designed to support active duty service members diagnosed with PTSD.

The Overcoming Adversity and Stress Injury Support (OASIS) and National Intrepid Center of Excellence (NICoE) have embraced the truly dynamic challenge of treating PTSD in active duty service members by augmenting traditional evidence-based exposure therapies for PTSD with a variety of integrative approaches. This strategy is due in no small part to demands from patients who seek alternatives to traditional treatment methods.
standard treatments that in some cases are perceived to be ineffective or incomplete. What follows is a discussion of these practices and how they might be practically configured to support evidence-based mainstream therapies.

ROLE OF INTEGRATIVE MEDICINE IN PTSD TREATMENT

In 2008, the National Center for Complementary and Alternative Medicine (NCCAM) issued guidelines grouping integrative practices (also known as CAM) into four categories: 1) natural products; 2) mind and body medicine; 3) manipulative and body-based practices; and 4) “other”, including movement therapies, traditional healers, energy field manipulation, and whole medical systems. Full definitions of these NCCAM definitions of these categories are found in Table 1.

In what appears to be the most thorough quantitative review of integrative treatments in PTSD, the US Veteran’s Administration (VA) conducted an exhaustive literature review, identifying nine peer-reviewed published studies on the effect of CAM modalities on PTSD. One study performed by Hollifield et al., which compared acupuncture and cognitive-behavioral therapy (CBT) each against a wait-list control group, was found to be both the best designed and most supportive of CAM’s efficacy in reducing PTSD symptoms. The other studies showed modest reductions in symptoms, but also tended to be plagued by study designs that either failed to apply experimental blinds or could not isolate CAM as the sole therapeutic modality applied to the participant.

Although the evidence-base for CAM interventions as stand-alone therapies is not robust, some evidence-based therapies rely heavily on CAM-type interventions as a part of the process. In particular, stress inoculation training (SIT) relies heavily upon mind-body tools such as deep breathing exercises, thought regulation, and progressive muscle relaxation. SIT, along with trauma-focused psychotherapy, which includes components of exposure and/or cognitive restructuring, were found to be the two best evidenced-based approaches for the treatment of PTSD in the review conducted to support the current DoD/VA Clinical Practice Guideline for PTSD, issued in 2010.

At the VA, psychotherapy treatment adherence has improved in its PTSD patient population over the past 20 years with the addition of residential care. For the DoD, residential treatment is a new endeavor to provide care consistent with the VA/DoD clinical practice guidelines, and also expand service to include novel treatments with an emerging evidence base.

Within the residential programs discussed in this article, patients are provided treatments that have been shown to have a positive impact on depression, substance use disorders, stress management, and resilience. Some are currently considered integrative, as the theoretical underpinnings are not consistent with Western concepts of illness, or they fall more appropriately under the heading “mind-body medicine” because, although they are not typically prescribed by doctors, they are based in a western model of health and illness.

Some of the services provided, such as

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### Table 1.

<table>
<thead>
<tr>
<th>NCCAM Categories and Definitions*</th>
<th>OASIS</th>
<th>NICOE</th>
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<tbody>
<tr>
<td>Natural Products: “… a variety of herbal medicines (also known as botanicals), vitamins, minerals, and other ‘natural’ products. Many are sold over the counter as dietary supplements.”</td>
<td>Nutritional supplementation</td>
<td>Nutritional Education</td>
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<tr>
<td>Mind and Body Medicine: “… focus on the interactions among the brain, mind, body, and behavior, with the intent to use the mind to affect physical functioning and promote health.”</td>
<td>Acupuncture, Meditation, Yoga, Spirituality, Deep Breathing, Biofeedback (EEG-based)</td>
<td>Acupuncture, Meditation, Yoga, Spirituality, Deep Breathing, Tai Chi, Biofeedback (heart rate variability-based)</td>
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<tr>
<td>Manipulative and Body-Based Practices: “… focus primarily on the structures and systems of the body, including the bones and joints, soft tissues, and circulatory and lymphatic systems.”</td>
<td>Physical Exercise</td>
<td>Mindful Movement</td>
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<tr>
<td>Other</td>
<td>Recreational Art, Recreational Music</td>
<td>Art Therapy, Healing Touch, Energy, Pet (canine) Therapy, Creative Writing, Music Therapy</td>
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* Definitions provided by the National Institutes for Health’s National Center for Complimentary and Alternative Medicine (NCCAM) 2007 fact sheet.
acupuncture, require only passive cooperation, whereas others, such as meditation, require the patient’s full engagement if the benefits of the intervention are to be realized.

INTEGRATIVE PRACTICES AT OASIS
The Therapeutic Milieu

OASIS is located at the Naval Base Point Loma, CA, and service members reside in multiple occupancy rooms during the 10 weeks of their treatment. Patients are encouraged to support each other through the therapeutic process, which is based in cognitive processing therapy (CPT) but also includes prolonged exposure therapy (PET) combined with a variety of integrative modalities.

Cohorts of 10 patients are admitted every 5 weeks, which allows mentorship of junior patients by senior patients. “Unit cohesion” is emphasized during the course of care.

Natural Products/Supplementation

At OASIS patients are routinely offered omega-3 fatty acids (fish oil supplement) at a dose of 2,000 mg daily. This supplement contains 18% eicosapentaenoic acid (EPA) and 12% docosahexaenoic acid (DHA). The rationale for this is multifold. Recent investigation into the effects of nutrition on mental health has highlighted the role of inflammation. The use of omega-3 fatty acids to reduce anxiety and depression may result from or contribute to changes in immunomodulation, which impacts inflammation levels in the body.

In addition, vagus nerve tone is thought to be important in promoting relaxation and stress mediation in the body. Indeed, both depression and psychological stress have welldocumented negative effects on vagal activation: omega-3 fatty acid intake can boost mood and vagal tone, dampen nuclear factor-kappa B activation and responses to endotoxin, and modulate the magnitude of inflammatory responses to stressors. For PTSD patients who are thought to have excessive sympathetic tone, it is hoped that the omega-3s will augment vagal (parasympathetic) tone.

Furthermore, when patients get to the program, many of them are on a variety of medications, such as SSRIs, SNRIs, antihistamines, sleep aids, and even some atypical antipsychotics. One goal of treatment is to obtain maximal symptom improvement with reduced-risk of adverse reactions due to polypharmacy. If patients are able to improve symptom parameters by augmenting their diet with omega-3s, then they might be able to reduce their medication loads.

The final motivation for using these supplements is that many of our patients experience chronic physical pain as a result of inflammation. Omega-3s have shown some benefit in that area as well. Although Vitamin D supplementation has been suggested by some as a helpful agent in treating depression, OASIS is not using vitamin D supplements at this time as the data remain unclear as to the benefit, and vitamin D toxicity has been reported in cases of overdose.

Acupuncture

At OASIS, acupuncture is used to address acute anxiety and irritability and pain that otherwise can derail the therapeutic process. In the combat trauma population, it is not uncommon to have chronic musculoskeletal pain as an area of clinical concern. Using acupuncture to treat that pain reduces the potential for polypharmacy resulting from comorbid mental health and pain conditions. Patients are given the option of treatment with acupuncture, which may include scalp, ear, body, or electroacupuncture (see Figure 1).

The strongest evidence for the use of acupuncture as an integrative treatment comes from research investigating musculoskeletal pain interventions, for which acupuncture has demonstrated efficacy when used in conjunction with conventional pain treatments. As noted previously, one small randomly controlled trial has documented the effectiveness of acupuncture as a stand-alone treatment for PTSD, although it is not used as a sole treatment at OASIS.

Meditation

Meditation was selected as an intervention at OASIS because there is some evidence that meditation activates parasympathetic pathways and inhibitory brain regions to counteract hyperarousal symptoms. Other data have suggested that, even if meditation does not reduce PTSD symptoms, it may reduce substance use in populations with high comorbidity. The expert consensus guidelines of the International Society for Traumatic Stress Studies also support the use of meditation as a second-line intervention for PTSD to target emotional, attentional, and behavioral (aggressive) disturbances.

At OASIS, an hour-long class on meditation is conducted each week to educate patients on its expected benefits, as well as to guide them through a meditation session that lasts approximately 15 minutes. Staff encourage patients to engage in a daily meditation practice and to use it as a coping skill to alleviate stress and promote a sense of being “grounded” in the moment. The response to this has been favorable, leading the program to adopt a brief daily meditation practice that is structured and supervised by staff to maximize the benefits of this intervention.
Yoga

Similar to meditation, the effects of yoga are believed to stem from the activation of parasympathetic circuits and improved modulation of the hypothalamic-pituitary-adrenal (HPA) axis. One neuroimaging study also documented a 27% increase in brain gamma-aminobutyric acid (GABA) levels after an hour-long yoga session, when compared with a control group (0% change in GABA level) who spent that time reading. At OASIS, patients are required to attend a weekly, hour-long yoga class taught by a trained, volunteer instructor. The poses and practices are consistent with standard Hatha yoga (see Figure 2). The yoga session immediately follows one of the weekly CPT sessions, since anecdotal evidence at OASIS has shown that time spent focused on breathing and body movement helps patients stay functional, even after experiencing the sometimes intense emotions triggered by CPT sessions.

Spirituality

Much has been written in the nonscientific literature about the impact of combat trauma on the spirit. A more recent report based on data from 28,000 randomly selected service members focused on spiritual beliefs as predictive factors for depression, PTSD, and suicidality. Their study showed high spirituality had a protective effect on depression symptoms, whereas medium and low spirituality levels predicted depression symptoms among those with moderate combat exposure. Medium spirituality levels also predicted PTSD symptoms among those with moderate levels of combat exposure; it also predicted self-reported suicidal ideation/attempt among those never deployed. Clearly, these results point to a complex relationship between spirituality and mental health.

At OASIS, patients spend 1 hour per week in a group dedicated to discussions about spirituality. Since its inception, the group has been run by several active and retired military chaplains. The goal is to allow a space for patients to discuss any issues related to faith or existential questions that arose as a result of their trauma. It is an ecumenical group and does not promote one faith over another. The group at OASIS is not manualized at this time, but this may be re-evaluated in the future since manualized groups are available through the VA.

Physical Exercise

The literature examining the direct impact of physical exercise in the treatment of PTSD is somewhat limited in quality and quantity. Some studies have shown a benefit to PTSD symptoms, whereas others show unchanged symptoms but improved quality of life. Physical exercise has repeatedly been shown to benefit patients with state and trait anxiety.

At OASIS, patients have access to a fully equipped gym and fitness instructors. They are scheduled for physical training (PT) for 1 hour every day, and expected to participate in some form of aerobic or anaerobic exercise, which may be self-directed but is supervised by the staff to ensure that some activity is actually taking place. In addition, patients may engage in team sports as a part of recreation therapy, and at least one fitness period per week is allotted to structured group exercise (eg, spin class).

Patients are given education on fitness effects for depression and anxiety, asked to self-pace fitness activities, and asked not to push through physical pain.

One additional important aspect of using physical exercise in this population is the fact that it is consistent with their military ethos. Maintaining physical fitness is at the core of military professionalism and military proficiency. Active-duty patients...
with combat-related PTSD will often find this a very acceptable modality. If it improves their PTSD symptoms, improves their readiness to return to duty, and possibly mitigates the weight gain caused by psychotropic medications, OASIS staff have concluded it makes sense to incorporate the use of this modality in multimodal treatment planning.

**Art Therapy/Music Therapy/Recreation Therapy**

Many patients with PTSD have lost the ability to find enjoyment in things they previously enjoyed. Their daily routine becomes one of managing potential symptom triggers and often, avoiding encounters with other people. There is very little time spent in play or recreation. This hurts their relationships as those around them may begin to see them as dour or severe. The reintroduction of playful and creative outlets provides a healthy outlet for stress, facilitates communication with others, and widens their options for socialization without the use of alcohol. The use of sports, games, art, and music helps to rebuild a lost sense of self-efficacy and promotes the belief that they can return their lives to a state of normalcy and wellness.

Although a recent Cochrane database review of the efficacy of sports and games for PTSD yielded no studies that met inclusion criteria, and despite an inconsistent evidence-base for art, music, and recreation therapy, anecdotal evidence at OASIS has shown that these modalities are very effective for patients.

We believe that further research will demonstrate these practices to be helpful as adjunctive measures to support the delivery of evidence-based psychotherapy. Patients are involved in at least 1.5 hours of structured artistic expression per week. They have created a variety of projects, such as murals symbolizing their recovery, as well as “trauma masks” that help them visualize and communicate the effects of the trauma on their psyche. They also create collages at three points in their treatment, reflecting where they were at the beginning, middle, and end of their treatment. These are used as a part of the graduation ceremony at the completion of treatment.

In addition, patients are given up to 7 hours per week of recreation therapy activities that include sports, games, and recreational and community service outings. Music therapy is provided at OASIS for at least 1 hour per week. This includes song writing, lyric analysis, and basic instruction in the use of musical instruments for relaxation or expression. In the literature, one study on music therapy demonstrated increased well-being and relaxation during listening to music and during musical improvisation. An increase in immunoglobulin A and decreased cortisol were also noted.

**INTEGRATIVE MEDICINE AT THE NICoE**

**Therapeutic Milieu**

Built through the generosity and support of the Intrepid Fallen Heroes Fund, the National Intrepid Center of Excellence (NICoE) is located in a state-of-the-art building on the campus of the new Walter Reed National Military Medical Center in Bethesda, MD. The facility was built expressly to address the “invisible wounds of war” (traumatic brain injury and PTSD), which are particularly associated with the conflicts in Iraq and Afghanistan. The building itself incorporates many specific features designed to minimize photosensitivity, promote relaxation, and support mindfulness-based interventions.

**Case Conceptualization**

NICoE features an interdisciplinary staff and holistic clinical care model integrating an array of diagnostic and treatment equipment that supports the tripartite NICoE mission: patient and family focused evaluation, individualized treatment planning, and clinical research. The NICoE residential model lasts up to 4 weeks and culminates in a discharge that hands-off directly to the patient’s primary care providers for sustainment and follow-up care.

The NICoE clinical evaluation is biopsychosocial-spiritual in content and includes an explicit CAM and wellness evaluation. Key contributors to this evaluation are an art therapist, nutritionist, recreational therapist, and chaplain who are supervised by a lead psychiatrist. Patient choice and control is emphasized in selecting modalities to address pain control, autonomic regulation, and relaxation response. It is believed that empowerment of the patient in this way improves compliance, and fosters a collaborative spirit with the treatment team. Additionally, the self-advocacy developed through selecting effective treatment options becomes an important skill for patients to utilize in the future.

At the conclusion of care, the interdisciplinary team develops an individualized treatment plan that is communicated back to the patient’s referring primary care manager. Depending upon the patient’s personal preference, desired outcomes, and perceived results, the final treatment plan may or may not include integrative practices. However, discharge surveys have revealed that CAM modalities make up a significant proportion NICoE treatments that patients most look forward to continuing at discharge.

**Mind and Body Practices**

As displayed in Table 1 (see page 182), NICoE offers a variety of traditional CAM modalities under the rubric of integrative medicine. Patients are encouraged, but not compelled, to try as many of them as possible during their stay at NICoE. The NICoE model is heavily invested in integrative medicine, and offers treatments such as Gua Sha, a Chinese fascial release modality, and micro-current therapy, which utilizes tiny pulses of energy to heal injuries at the cellular level, both of which have been shown to be beneficial for musculoskeletal pain.

Acupuncture at NICoE is provided...
by a psychiatrist and a physical medicine and rehabilitation physician, trained and licensed to perform regimented medical acupuncture as taught in the Medical Acupuncture for Physicians course. This practice applies a rigorous understanding of both western and eastern perspectives of anatomy and physiology, and a firm knowledge of acupuncture points and channels. Medical acupuncture such as that utilized at NICoE is highly regulated compared with nonmedical versions of acupuncture.

Although acupuncture is primarily indicated as a treatment for musculoskeletal pain, NICoE physicians have found it beneficial for helping to stimulate a bond between patient and provider, so much so that the phrase “come for the needles, stay for the therapy” has often been repeated. There has been some speculation that the close, physical hands-on contact required to administer acupuncture helps patients lower defensive postures associated with the high sympathetic nervous system dominance consistent with PTSD hyperarousal. Such interpersonal proximity, combined with extended periods of low external stimulation during treatment, may foster greater parasympathetic regulation of the nervous system, a situation that others have hypothesized will promote social engagement between patient and provider.

**Art Therapy**

Art therapy at NICoE has proven to be a very salient treatment. The emotionally compelling artwork seems to arouse a visceral sense of the patients’ struggle with their experiences of combat. It is also believed that many patients with PTSD have impaired declarative memory, and facilitating expression of their trauma through artwork is helpful in supplementing traditional psychotherapy.

When indicated by the initial clinical intake evaluation, the art therapist at NICoE engages in a multistage program that starts with individualized sessions that include and initiation of a personally tailored art project.

The week one project, described as “warrior identities,” encompasses the use of preformed, content-void, white androgynous masks that serve as the blank canvas upon which the service member can project his or her inner- and outer-self through artistic expression.

**Their subjective popularity suggests CAM modalities are a critical buttress to standard, first-line, trauma-focused therapies for PTSD.**

Art sessions may begin with guided imagery to help reduce tension and cope with potential hyperarousal symptoms. Patients move from masks to montages in the third week of the program, and conclude the final week with the possibility of having patients present their art work to the treatment team and discussing it within the context of their overall treatment experience.

**Canine/Pet Therapy**

Visitors, patients, and staff frequently come into contact with the two or more trained canines that routinely patrol the halls of NICoE. These dogs are raised by trainers who have specifically taught the dogs to be nurturing and patient with their masters/patients. The dogs are perceived as protective and reassuring. They not only have the capacity to help service members differentiate real from imagined danger, and thus hyper-vigilance, but also help patients learn or relearn trust and emotional bonding, which are counter to PTSD symptoms of avoidance and numbing.

Another benefit of the dog program at NICoE is that the patients are able to engage in several sessions of training a dog who will later be given as a therapy animal to a veteran. They feel in this way that they are “paying it forward” by continuing to provide service to others.

NICoE’s use of CAM modalities is integrative and focuses as much on relieving pain and establishing the therapeutic alliance between patient and provider as it does on relieving symptoms of PTSD and working through trauma-related memories and cognitions. Despite the limited body of evidence supporting CAM modalities as stand-alone treatments for PTSD, their subjective popularity, both with patients and providers at NICoE, suggests that as integrative or adjunctive interventions, CAM modalities are a critical buttress to standard, first-line, trauma-focused therapies for PTSD and traumatic brain injury.

**CONCLUSIONS**

There are a variety of reasons why integrative medicine should be included in comprehensive programs for PTSD treatment. Clearly the evidence base has not developed to the extent that is has for exposure-based therapies or pharmacotherapy for PTSD, but absence of evidence is not evidence of absence. There are numerous recent examples of therapies that were first thought to be so outside the norm as to be inappropriate for rational, evidence-based care, but gained acceptance after further empirical study. For example, in the late 1990s eye movement desensitization and reprocessing was thought by many to be akin to mesmerism. It is now recommended as an effective treatment by the American Psychiatric Association, the VA, the National Institute for Clinical Excellence (UK), and others, and is in the DoD Clinical Practice Guidelines for PTSD.

One critical factor in using CAM to augment evidence-based treatment is that patients tend to comply with them. Many treatments for PTSD are known to have a high drop-out rate, but CAM modalities may encourage patients to remain engaged if the services are packaged together.
There are no current data that show that patients remain in CAM treatment longer than other treatments, but there is one study that demonstrated that patients with a higher internal locus of control were more likely to select CAM types of treatment. Incorporating CAM can give a patient a greater sense of autonomy and empower them to approach their recovery assertively. This may be important for triage of PTSD patients into psychotherapy, as it requires a high degree of commitment on the part of the patient.33

Good access to care for the population of returning service members with PTSD will require a great number of providers. Determining which modalities of care offer benefit is crucially important to expanding the size of the provider base who can effectively treat this disorder. Multimodal programs offer an opportunity to study the effectiveness of CAM modalities and increase the knowledge base of how to effectively treat syndromes of traumatic stress.

REFERENCES