

# Dreampad: New Home-based Technology to Improve Sleep and Reduce PTSD Symptoms

Randall Redfield and Ron Minson, MD

## **Introduction:**

*My father suffered from PTSD. As an 18-year old in combat in WWII, he lost an eye and suffered physical and psychological pain which went untreated and plagued him for the rest of his life. What we now call “invisible injuries” were even more invisible then - the term “PTSD” didn’t even exist. He had nightmares, he woke up in cold sweats, he drank. My mother had her hands full with four kids. She had no idea how to deal with his mood swings and depression. I was four when he took his own life.*

*Fast forward 50 years: I developed a product, a pillow called the Dreampad, to calm children with high levels of stress. The Dreampad plays music through gentle vibration, which triggers the body’s relaxation response, and is being used by hundreds of clinics around the country, including the pediatric hospitals of Duke, Stanford, Harvard and Emory universities. Studies by clinical researchers suggest that the Dreampad has the same positive effect on adults as children, and can reduce stress and improve sleep for a variety of groups, including those with PTSD-related symptoms. My goal to make it available and affordable for our Soldiers and their families in the hope that it can alleviate, and even prevent, the suffering that my own family endured. In writing this article, I have asked Ron Minson, MD, Clinical Director at Integrated Listening Systems and one of the world’s top experts on the therapeutic application of sound, to lend his vast medical expertise as my co-author. - Randall Redfield*

For years we have known that sleep deprivation exacerbates PTSD symptoms and also poses a major obstacle to successful treatment. The standard recommendations for improving sleep – CBTI (cognitive behavioral therapy for insomnia), exercise, reducing alcohol and food intake, as well as screen time before bed, and in addition to the utilization of calming activities such as yoga and meditation, are all proven to be helpful in facilitation of productive sleep. Oftentimes, however, these sleep hygiene techniques are simply insufficient in overcoming the serious sleep challenges presented by a hyper-aroused nervous system, recurrent nightmares and other PTSD symptoms. Medication is always an option, and in some cases a hugely valuable one; however, most, if not all, professionals recognize the pitfalls of relying on medications and would much prefer “prescription” of more non-pharmacological options. A new device, called the Dreampad, is one such option. The Dreampad uses bone conduction technology to deliver music through vibration, a vibration which is both pleasant to listen to and therapeutically calming. This article will carefully review the Dreampad, the mechanism by which it works, and supporting research regarding its effectiveness in the areas of stress and sleep, including a pilot study, which holds significant promise for military personnel experiencing stress, poor sleep and PTSD-related symptoms.



By way of introduction, readers may be aware that bone conduction technology is used as a communication tool in loud environments, such as in heavy equipment movers at construction sites and in the helmets of armored tank personnel (the Navy SEALs who assassinated Osama bin Laden used bone conduction headsets to communicate during the raid). In bone conduction headsets, a transducer is embedded within the headset so that it rests against the skull. Our bones are excellent conductors and the sound signal received through the bone conductor is immediately transmitted along the bones of the skull to the inner ear (versus a traditional headset, or speaker, which sends an airborne signal through the outer ear).

The Dreampad is the first product to experiment with bone conduction technology in the areas of sleep and trauma therapy. The device is actually a comfortable pillow that contains two embedded

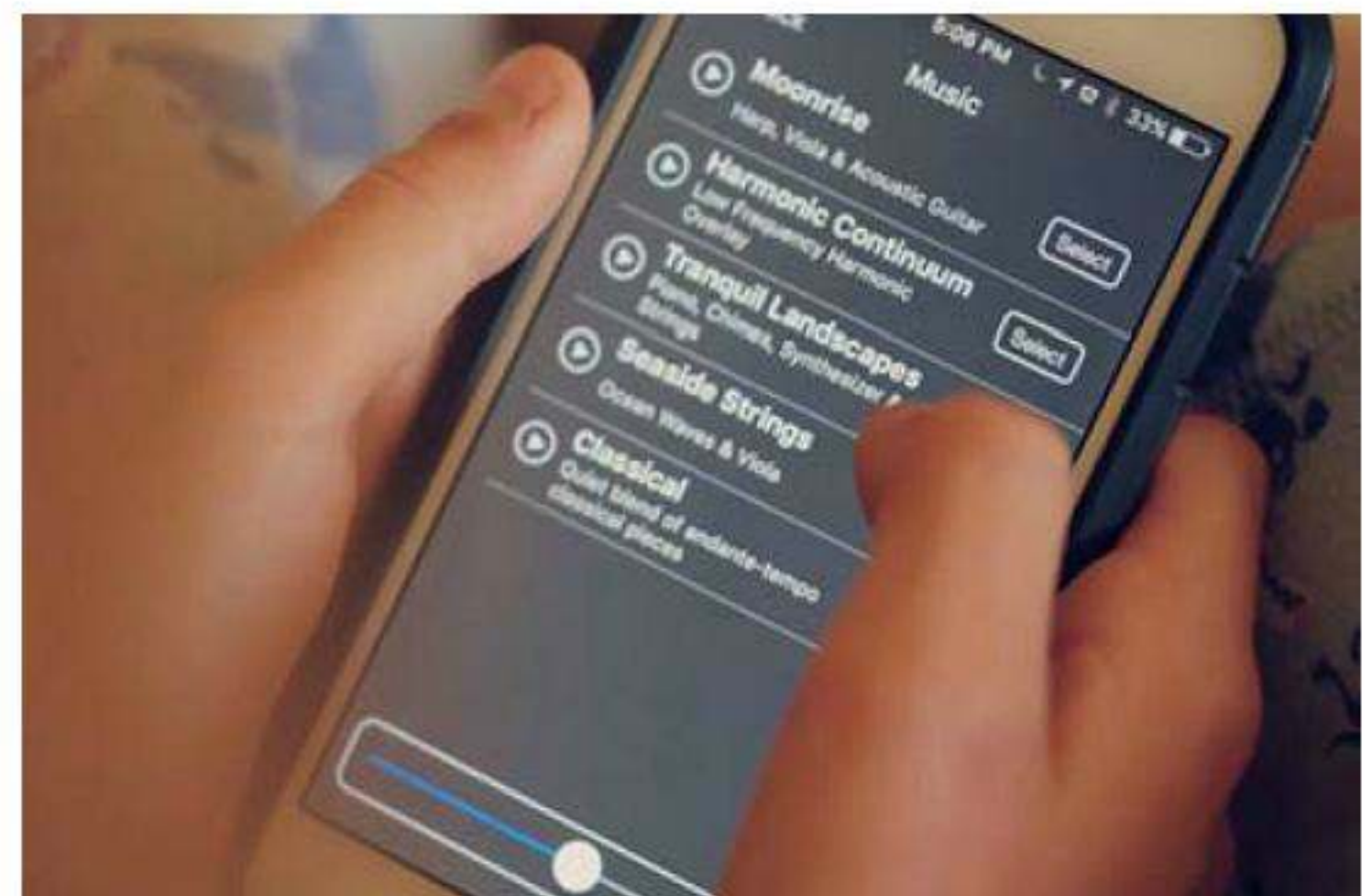
bone conduction transducers that play music, which cannot be heard until the user lays their head directly on the pillow. Once the user's head is on the pillow, the music heard does not sound altogether different from music heard through one's outer ear. On a physiological level, however, something quite different is occurring. Preliminary studies suggest that within a few minutes of the vibration traveling to the bony area surrounding the middle and inner ear, the body's relaxation response, elicited by the parasympathetic nervous system, is activated. For those diagnosed with PTSD, this has the effect of countering or calming the fight-or-flight state resulting from traumatic experiences. For the working professional with mild sleep difficulties, it tends to quiet down the "monkey mind" - that non-stop churn of thoughts left over from the day - and allows one to let go of stress and relax enough to permit drifting off to sleep.

The Dreampad comes with a free music app, which offers a selection of 10 songs. These “songs” are specifically designed per sleep research related to tempo, frequency bandwidths and structure. (1) The music app is downloadable to a smart phone and includes a volume control and timer. This allows the user to customize the playing experience per their own sleep habits. It can be set to play for a half hour to facilitate falling asleep, or if one tends to awaken in the middle of the night, it can be set it to play all night so that upon awakening, it lulls the user back to sleep. Studies measuring the effectiveness of the Dreampad have shown that there is an immediate relaxing effect. For instance, using it for 15 minutes not only allows sleep to occur, but offers a long-term effect as well, which carries over beyond the listening time. (2,3)

Heart rate variability (HRV) is generally accepted as a reliable and objective measure of a relaxed state, i.e., parasympathetic nervous system activity. A pilot study conducted by a sleep company in Colorado, used HRV to determine the effect of the Dreampad on healthy adults. Employing a single-subject design, the researchers first collected an HRV baseline for each subject while listening to music played through a speaker. The same music was then played through the Dreampad in order to compare the baseline HRV with the Dreampad HRV. Eleven full data sets resulted from the study. Nine of the eleven showed a significant increase in HRV within 5 minutes of listening to music through the Dreampad. (2)

Another study, conducted by Columbia University Medical Center (3) and published in December of 2016, measured the effect of the Dreampad on adults with stress-related sleep problems (but without

a diagnosis of insomnia). This study demonstrated statistically significant results in the area of sleep quality, with Dreampad users having fewer nighttime awakenings during the night. A study conducted on autistic children with sleep difficulties and high levels of anxiety showed positive results with all participants in terms of falling asleep, staying asleep, and functional abilities/behavior on days following use of the Dreampad. (4) While these studies are relatively small (the larger study, by Columbia University, included 29 adults), they are encouraging and indicate the need for more research in the area of sleep disturbances and any number of psychological disorders in which sleep disturbances accompany other diagnostic features.



Clinical feedback over the past few years began with children diagnosed with autism spectrum disorders and has gradually expanded to a broad variety of adult groups who are seeing similar positive effects, including adults with trauma-related symptoms. As a first step toward measuring the effect of the Dreampad on PTSD, the HeartSprings Rehabilitation Clinic in Fargo, North Dakota conducted a pilot study with 10 war veterans. (5) During the 30-day study, each participant recorded their sleep habits and pain levels prior to and while using the Dreampad. The initial

results found that all ten veterans were helped by the Dreampad in at least one of the following ways:

- Falling asleep faster
- Falling back asleep after a nightmare (and, in many cases, changing the pattern and intensity of recurring dreams)
- Reducing symptoms such as sweating, heart pounding and hyper-vigilance

Three months after the study was completed, 8 of the 10 veterans reported that they continued to use the Dreampad and to experience improved sleep. Their comments, a several of which are listed below, indicate that the Dreampad is not a cure-all for the complex array of symptoms associated with PTSD; however, it may be a very powerful tool for alleviating symptoms and improving sleep:

*"I use the pillow three times a week. It helps me get back to sleep within 10 to 15 minutes instead of hours like it used to take." - C.S.*

*"I use the pillow 3 to 7 times a week. I am still restless, but it helps reduce the nightmares." - C.D.*

*"I LOVE that pillow! I am sleeping almost all night, every night for six hours!" (therapist comment: "Before that she was sleeping less than three hours a night.") - J.S.*

*"I use the Dreampad every night. It's reduced the time it takes to fall asleep. It is calming and reduces my anxiety! I have less frequent nightmares and it helps in falling back to sleep."- B.K.*

*"I use the Dreampad almost every night. I fall asleep faster and stay asleep longer, feeling more refreshed in the morning. After having*

*a nightmare, it takes me 10 to 15 minutes to fall asleep and my nightmares are less in number and less in intensity...I have gone through lots of counseling, treatment and groups for pain, PTSD and sleep. Having the Dreampad is a useful tool to help drown out the noise and ringing in my head. I think the vibration in the pillow helps my brain relax." - B.A.*



Just like the brain, the autonomic nervous system (the system that regulates functions like heart rate and blood pressure and activates a "fight or flight" response under stress) is plastic and can "learn" to stay more activated than necessary. Many of these veterans' comments are examples of living in a state of chronic defensiveness, further fueled by a lack of sleep. Stress and poor sleep become a vicious cycle that affects almost all aspects of life, including everything from mood and diet to the immune system functioning. This constant drain of energy makes social engagement and participation in life an exhausting and negative experience. However, in the same way the body/mind system learned to stay vigilant, it can learn to relax. Sleep is the first and most important step in that healing process. Once we are well rested, taking on therapies which entail lifestyle changes becomes a real possibility; with-

out sleep, this is nearly impossible. As the autonomic nervous system changes and finds a healthy balance, we can settle into a more relaxed state of being, which supports motivation and social engagement.

The ability of the Dreampad to play a role in shifting one's physiological and psychological state from tension to relaxation is very well worth investigating, particularly in light of the potential negative side effects of medications and compliance challenges surrounding cognitive behavioral therapies. We hope that the medical and military communities are open-minded and willing to give the Dreampad a more comprehensive look, and to measure how it might assist the populations they are serving in overcoming sleep disturbances. For our part, with the utmost empathy for those who are impacted by sleep and trauma as a result of serving their country, we will do everything possible to support further research and access to the product by members of the Armed Forces community.

### **Contact Information:**

The Dreampad is available at a discounted price for Combat Stress readers at [www.dreampadsleep.com/ais](http://www.dreampadsleep.com/ais). There is a 30-day return policy for a full refund for all purchases. Professionals working with PTSD please contact [info@dreampadsleep.com](mailto:info@dreampadsleep.com) to learn more.

### **References:**

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### **About the Authors**

*Randall Redfield co-founded Integrated Listening Systems (iLs) in 2007 in an effort to integrate two modalities of therapy: sound and movement. Since then, iLs has trained 9,000 professionals and is used in conjunction with occupational, speech and physical therapy in more than 20 countries. In 2009, he utilized bone conduction technology to develop a pillow to help calm children with high levels of anxiety, particularly those with autism. Redfield was awarded a patent in 2012, and then worked with the iLs product development team to create a new line of more comfortable Dreampads designed for adults. As the CEO of iLs, he is working to bring the stress-relieving effects of the Dreampad to those who have served in the military, as well as to the broader population impacted by trauma and poor sleep.*

*Ron B. Minson, M.D. is board-certified in psychiatry and neurology. His experience includes serving as a family physician, clinical psychiatrist, Chief of Psychiatry for Presbyterian Medical Center, and Director of Behavioral Sciences at Mercy Hospital in Denver. Dr. Minson is the Clinical Director and Advanced Trainer for Integrated Listening Systems, a company which improves brain function through a combined music and movement program. As one of the leading authorities on the clinical application of sound, Dr. Minson writes and presents to medical and educational audiences exploring the new field of brain fitness.*

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