



Recommendations To Prevent and Treat Post-Traumatic Stress Disorder for Military Personnel

KEYWORDS

Stress, Traumatic Stress Disorder, Military Personnel

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ABSTRACT *The hypotheses of this article are that (1) caffeine, refined carbohydrates, lack of sleep, the absence of stress-reduction modeling, and poor air quality combine with a traumatic event to increase the incidence of post traumatic stress disorder, (2) that substantial reduction of caffeine and refined carbohydrates, increased sleep, metaphysical modeling to reduce stress, and improved air quality, would help prevent PTSD, and (3) treatment of those afflicted should include prevention options plus earthing and inspection of homes and automobiles to improve air quality and reduce electromagnetic fields.*

Prevention of PTSD requires elimination of non-medical caffeine and reduction of refined carbohydrates. Caffeine is an addictive drug, causes overnight withdrawal symptoms which are "corrected" with the day's coffee, is crisis elastic, raises blood pressure particularly when one is under stress, may adversely affect cortisol, increases the fight or flight mode, is correlated with smoking, alcohol, and cocaine use, causes hallucinations and coffee allergies, exacerbates psychotic symptoms, abolishes threat-related mPFC wall activation associated with post-traumatic stress disorder, etc. Refined carbohydrates increase stress, anxiety, hyperactivity, and blood pressure. Sleep must be increased because lack thereof contributes to hallucination, headaches, confusion, anxiety disorders, irritability, seizures, mania, and high blood pressure. Metaphysical modeling would be helpful to reduce stress. Indoor and outdoor air quality should be reviewed for improvement. All Department of Defense (DOD) personnel who follow the No Caffeine Rule should be required to take exercise breaks at least every ten minutes in every-two hour period at work to increase alertness and productivity.

Treatment of PTSD requires dietary intervention to improve the overall diet including eliminating caffeine and reducing refined carbohydrates, managing sleep, engaging in earthing to normalize body functions, swimming with a face mask and snorkel, and inspecting homes and automobiles for poor air quality and electromagnetic fields.

Hypotheses

The hypotheses of this article are that (1) caffeine, refined carbohydrates, lack of sleep, the absence of stress-reduction modeling, and poor air quality combine with a traumatic event to increase the incidence of post-traumatic stress disorder, (2) that substantial reduction of caffeine and refined carbohydrates, increased sleep, metaphysical modeling to reduce stress, and improved air quality, would substantially reduce the incidence of PTSD by Department of Defense personnel, and (3) treatment of those afflicted should include prevention options plus earthing and inspection of homes and automobiles to improve air quality and reduce electromagnetic fields.

The approach we use to support these hypotheses is to review the literature of prevention options and the literature and our knowledge of a healthier life style from our research in creating Six Pillar Tips for Health Management.

Part I: The nature and prevalence of PTSD

Posttraumatic stress disorder

PTSD Defined

PTSD is defined as a trauma- and stressor-related disorder in the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5); in DSM-4, it was classified as an anxiety disorder. Now, DMS-5 indicates that PTSD can be understood in the context of anxiety and fear-based context in some cases, but in other cases PTSD resembles additional symptoms such as anhedonic (i.e., inability to experience pleasure) or dysphoric mood states (i.e., unhappiness, discontentment, anxiety), arousal and reactive-externalizing symptoms, dissociative symptoms, or combinations of

these symptoms. . [1, 2]

PTSD is always associated with a traumatic or stressful event and usually develops from an unexpected traumatic event such as violent personal assault, confinement, terrorist attack, severe automobile accident, explosion, etc. [1] Great danger is usually present and one is fearful of his or her life and for the lives of others. The results are four clusters of symptoms which are disruptive of normal life including intrusion, avoidance, negative alterations in cognition and mood, and alterations in arousal and reactivity [1] During the first month after the traumatic event (excepting the first three days), the feelings are categorized as Acute Stress Disorder (ASD), up to three months it is termed acute PTSD, and in subsequent months, chronic PTSD. If the symptoms begin at least six months after the traumatic event, the condition is referred to as delayed-onset PTSD. [3] Direct exposure to violence is the single greatest directly measured cause.

Prevalence of PTSD

The lifetime prevalence of PTSD in the United States has been estimated from studies at between eight to 12 percent with the incidence rate for women being about twice that of men. The PTSD life time prevalence rates in foreign countries are much lower with the highest rate outside the United States being 4.8 percent in the Ukraine. [4] DSM-5, 276 indicates the lifetime risk for PTSD is 8.7 percent. In Europe, and most Asian, African, and Latin American countries the rates vary from about 0.5 to 1.0 percent. [1]

The PTSD lifetime prevalence rate for Vietnam veterans is estimated at 31 percent for men and 27 percent for

women. [4] Thus, the lifetime prevalence for male Vietnam veterans is about five times the rate for men in the United States in general (e.g., 31%/6% = 5 times). Since 2,594,000 served in the borders of South Vietnam from 1965 to 1973, the Viet Nam war produced about 778,200 potential lifetime PTSD victims (PTSDVs; $2,594,000 \times .3 = 778,200$ PTSDVs). This statistic disregards those serving before 1964 (about 50,000) and those serving in other countries of southeast Asia and off shore. [5]

The lifetime PTSD prevalence rate for Iraq and Afghanistan veterans is estimated at 30 percent. [6] Approximately 1,250,663 veterans who served in Iraq and Afghanistan are eligible for health care benefits from the Department of Veterans Affairs and of those 168,854 have been diagnosed with PTSD. [7] Application of the 30 percent lifetime rate to those servings suggested 375,000 potential PTSD victims from Iraq and Afghanistan ($1,250,663 \times .3 = 375,200$) for a combined total of 1,153,400 potential lifetime PTSD U.S. military victims for the three wars ($778,200 + 375,200 = 1,153,400$).

Clearly the number of PTSD injuries from Viet Nam, Iraq, and Afghanistan suggest that steps must be taken to reduce the incidence and improve treatment for complete cures of this dreadful illness.

Part II: Recommendations to reduce the incidence of PTSD for military personnel

Recommendation #1: Substantially reduce caffeine consumption by DOD personnel

Caffeine consumption

Between 82-92 percent of adults in North America consume caffeine-containing beverages. [8] The average daily consumption of Americans consuming caffeine in coffee, tea, soft drinks and chocolate is about 280 mg/day. [9], although some average estimates are much higher. Twenty-five percent of the population may be taking more than 500 mg per day. [10] Seventy-five percent of high school students in the US drink at least one caffeinated beverage every day. Research findings indicate a relationship between caffeine consumption and violent behavior and conduct disorder by adolescents. [11] Adolescent caffeine consumption averages 60-70 mg/day and ranges up to 800 mg/day, mostly from soda. The FDA limits caffeine to 71 mg per 12 oz of soda. [12]

Energy drinks (ED) are beverages containing caffeine, taurine, guarana, kola nut, yerba mate, cocoa, vitamins, herbal supplements (ginseng), and sugar or sweeteners and are marketed to increase energy, weight loss, stamina, athletic performance, and concentration. They are the fastest growing beverage market with sales over \$9 billion in 2011. Fifty percent of the energy drink market is to children (under 12), adolescents (12-18), and young adults (19-25). There is no present regulation of caffeine in energy drinks, and they usually contain 70-80 mg of caffeine. "Energy Shots" may have five times the caffeine of an energy drink (EDs). EDs have additional caffeine from guarana, kola nut, yerba mate, and cocoa. Each gram of guarana has 40-80 mg of caffeine with a potentially longer half-life because of other compounds, and the caffeine from these other products need not be listed. EDs have no therapeutic benefit. In 2008, authorities in Germany, Hong Kong, and Taiwan detected 0.13 ug cocaine in Red Bull Cola from the coca leaf and 16 German states banned the product. In one study of energy drink consumption, aver-

age systolic blood pressure increased 9 to 10 mm Hg and average heart rate increased 5 to 7 beats per minute four hours after consumption. [12] Imagine the effect of energy drink consumption on military personnel who consume several times the energy drinks than their age counterparts in the United States and the potential effect on PTSD!

Attributes of caffeine

The operation of caffeine on the human body: In general Moderate low caffeine doses of 200-300 mg/day for the normal person is believed to improve intellectual effort, enhance mental acuity, decrease drowsiness, fatigue, and reaction time. [13] But alas, the "normal person," is often defined by the absence of highly adverse effects after the fact.

Contrary to the belief of improved intellectual effort from caffeine, Rogers, et. al. [14] found in a study of 369 participants that medium-high caffeine consumption (> 40 mg/day) provided no net benefit for mental alertness due to tolerance. Habitual coffee drinkers simply returned to normal intellectual effort after overnight withdrawal. For those consuming less than 40 mg/day, the reduction in sleepiness from caffeine was offset by anxiety/jitteriness for no net benefit in mental alertness.

Caffeine is an addictive drug for which tolerance develops with potentially severe withdrawal symptoms. [10] It is a powerful central nervous system stimulant, antagonizes the A1 and A2a adenosine receptors [13], the benzodiazepine receptor antagonist, and inhibits phosphodiesterase. [12]. The A1 receptors are found throughout the brain and control sleep and arousal. The adenosine receptors are connected to the dopaminergic system, which moderates behavior in the brain. Disturbance of the adenosine receptors may exacerbate psychotic symptoms. Caffeine in the sympathetic nervous system puts the body in fight or flight mode. [15] Caffeine also affects the cortex, respiratory, vasomotor, and vagal center of the medulla and the spinal cord at high doses. [16] Caffeine is correlated with smoking, alcohol, and cocaine use, and heavy use by psychiatric patients (750 mg or more/day). [15] It also affects the heart muscle, the respiratory system, and the spinal cord. [10] Heavy caffeine consumption has been associated with seizures, mania, stroke, and sudden death. [12]

Caffeine has a physiological half-life of about 3.5 hours for normal people, but the actual half-life depends upon each individual. If one has a liver problem, the half-life can increase to 96 hours. The relatively long half-life means that drinking several cups of coffee a day can produce very high blood concentrations of caffeine. [10]

Notably, coffee has over 1,000 different chemicals, many formed during the roasting process; thus, it is apparent that scientists do not know the harmful effects of all of these or of the synergistic harmful effects of groups working together. [17]

Caffeine as a cause of anxiety and related minor adverse health conditions

Caffeine may cause insomnia, restlessness, excitement, tinnitus, flashes of light, quivering muscles, headaches, tachycardia, extrasystoles (premature contraction of the heart), low-grade fever, loss of self control, depression, mild delirium, agitation, disorientation, and symptoms resembling a true psychotic state. [10]

"Caffeinism" is chronic subjective anxiety caused by regular consumption of high levels of caffeine. (e.g., >1000 mg/day or about ten cups of coffee). Caffeinism is virtually indistinguishable from severe chronic anxiety. Caffeine can exacerbate the effects of an anxiety-induced situation, and worsen an existing anxiety condition, including panic disorder. Caffeine is a psychotropic drug—a chemical substance crossing the blood brain barrier acting primarily on the central nervous system resulting in alternations in perception, mood, consciousness, cognition, and behavior. [18]

Caffeine as a cause of panic disorder

Caffeine's influence on panic disorder depends upon the dosage and interactions with polymorphisms (genetic variations) of the A2a adenosine receptor in the brain. [8] Thus, it is believed that caffeine contributes to or causes panic disorder because of genetic modifications in the A2a receptor. A review of the literature by Hughes [18] indicated that "...caffeine definitely seems capable of exacerbating pre-existing chronic anxiety in PD (panic disorder) and possibly other anxiety disordered individuals."

Caffeine as a cause of PTSD

Smith, et. al. [19] conducted a study to detect the effect of caffeine on "brain regions implicated in social threat processing and anxiety." They found that "caffeine induced threat-related midbrain-PAG activation" by "abolishing threat-related mPFC wall activation." Reduced mPFC activation to threat is associated with "clinical anxiety disorders, including post-traumatic stress disorder." "Conversely, increased mPFC activation to threat has been observed in individual with better emotion regulation abilities [19, 20] and during instructed emotion regulation [21]" In their "DISCUSSION," Smith et. al. (pp. 835-38), provide a well-referenced technical discussion of the effect of caffeine on brain activation to social signals of threat increasing anxiety and blood pressure; the reader would be wise to review that portion of the article.

This study did not address the unique stress under which combat-theater military personnel suffer and presumably the additional combat stress and caffeine create even greater opportunity for PTSD in association with reduced mPFC activation and a traumatic event.

Interactions of caffeine and stress: Blood pressure.

One of the hypotheses of this article is that caffeine, in association with extraordinarily high levels of stress and other adverse life style attributes, increases the likelihood of PTSD in association with military combat and traumatic events. In order to assess the likelihood that caffeine increases stress, I reviewed the literature of blood pressure and cortisol response to caffeine. My *a priori* hypothesis was that increases in stress increase blood pressure. Increases in cortisol, the stress hormone, are a measure of the increase in stress; notably, however, some PTSDVs may have reduced levels of cortisol prior to a traumatic experience, while others may have more. [22]

Hartley [23] concluded from a review of the literature that caffeine increases blood pressure in individuals consuming 1-4 cups of brewed coffee (90-350 mg) generally from 3/4 mm Hg to 14/13 mm Hg, and can last from three to four hours. Individuals with hypertension (*i.e.*, high blood pressure) have an even greater potential rise in blood pressure. Indeed, with the extraordinarily high levels of stress of combat military personnel, many more of these men and women are subject to hypertension than the population generally, and caffeine will probably increase blood pressure even more than civilian clinical stud-

ies. And increases in blood pressure may be a measure of the level of the extra stress combat military personnel incur.

The consensus is that caffeine raises blood pressure for individuals under stress compared with individuals under the same stress but with no caffeine [24, 25, 26]. Further, studies have shown that caffeine raises blood pressure in the work environment. [27] In an e-mail to me dated December 2, 2013 9:37 AM, Dr. Jim Lane stated:

"To answer your final question, based upon my research knowledge, the consensus of research to date supports a conclusion that caffeine adds a blood pressure increase to the blood pressure increase elicited by stress."

I conclude that it is highly likely that caffeine consumption by combat forces increases their blood pressure over abstinence of caffeine and probably much greater than in the non-combat clinical tests reported in the literature. Moreover, caffeine users generally increase their consumption of caffeine in times of stress and the extra consumption increases blood pressure and stress even more. Further, caffeine taken before heavy exercise may significantly increase blood pressure. [23]

Interactions of caffeine and stress: Cortisol

Cortisol is secreted by the adrenal glands and increases during the "fight or flight" response to danger. Small increases in cortisol are beneficial because it increases memory, energy, and immunity, and makes one less sensitive to pain. Too much cortisol leads to chronic stress, suppressed thyroid function, blood sugar imbalance, decreased bone density, muscle tissue, and immunity, and increased abdominal fat and cholesterol. Controlling cortisol requires life style changes and relaxation techniques.

Lovallo, et. al. [28] found that caffeine elevates cortisol secretion in both men and women, although the processes may be a bit different in each. In combat situations, where stress and cortisol are already high, caffeine will probably increase cortisol even more and caffeine should be prohibited to reduce cortisol and thereby reduce combat-related stress. Similarly, Shepard [29] [found that male medical students had increased cortisol and blood pressure with the addition of caffeine and recommended that those with a high risk for hypertension refrain from caffeine when stress is high—but the problem is that vices are stress-elastic. The Zero Tolerance Rule (ZTR) suggests elimination of caffeine at all times for those at high risk for hypertension. Since it is difficult to distinguish military personnel with a high risk for hypertension from those without high risk, a uniform prohibition of caffeinated products is appropriate. Further, combat stress may increase the number of those with hypertension.

Interactions of caffeine and stress: Hallucinations

In a study of 92 participants, S. F. Crowe found that five cups of coffee (about 500 mg) in a stressful situation caused hallucinations in the sense that participants reported hearing a song that was never played. In essence, these individuals were exhibiting symptoms of schizophrenia without having the illness *per se*. These hallucinations indicated that "...further caution needs to be exercised with the use of this overtly 'safe' drug." [30] It has also been shown that psychiatric patients reduced their hostility, anxiety, and irritability scores when caffeinated beverages were eliminated [31]

Caffeine Allergies

Caffeine allergies are cerebral allergies caused by the inability of the body to metabolize caffeine and causes fight or flight mode, which can be mistaken for hyperactivity, anxiety, or panic disorder. When this occurs, caffeine is absorbed by organs and cells and may reach toxic proportions. Symptoms may be a severe psychotic state including mood changes, irrational behavior, loss of insight, delusions, paranoia, and hallucination. Thus, the caffeine-allergic person should obviously not consume caffeine. [32] Since these allergies are difficult to detect, the potential for allergic reactions is another reason to implement caffeine prohibition for DOD personnel.

Evidence of Department of Defense (DOD) awareness that caffeine creates excess and harmful stress I have found three public documents that indicate DOD personnel are aware that caffeine creates serious mental problems. The first of these was an interview with Allison Lighthall, R.N., B.S.N., M.S.N. in which Ms. Lighthall discussed the assistance she provided combat veterans with severe combat stress, PTSD, sleep disturbances, irritability, and increased suicide rates. She discovered that many of her patients were consuming grossly excessive caffeine from 400 mg/day to 1,300 mg/day and the elimination of caffeine in their diets led to elimination of their symptoms in many cases. She further noted that (1) caffeine causes irritability, the precursor to suicide, (2) caffeine adds to the likelihood of panic attacks, (3) the addition of caffeine to alcoholic drinks doubles the chances of sexual assault and (4) restorative sleep is absolutely critical for good judgment, quick releases, and sound functioning. [33]

The second article by Lieberman, et. al. [34] indicated that U.S. Navy SEALs were not permitted to consume coffee or other beverages containing caffeine during Hell Week. In my opinion, the SEAL Hell Week No Caffeine Rule should be extended to all combat personnel and supported by other DOD personnel who work with uniformed military personnel.

The third article by Tobin [35] reported on a survey of energy drink consumption by 1,249 military service members in which it was learned that 44.8 percent of deployed service members consumed at least one energy drink daily and 13.9 percent drink three or more per day. Those drinking three or more energy drinks per day report sleeping \leq 4 hours a night on average, and had sleep problems on more than 50% of nights in the last 30 days because of combat stress, personal problems, and illness. Fifty-percent (50.2) percent reported sleeping \leq five hours, and those drinking three or more energy drinks per day were more likely to report sleep disruption related to stress and illness and more likely to fall asleep during briefings or on guard duty. The article indicated that six percent of adolescents and young adults drink one or more energy drinks per day; thus military consumption is over seven times the youthful consumption of energy drinks.

Tobin concludes by stating that military personnel "... should be encouraged to moderate their energy drink consumption in combat environments." I believe total abstinence is the preferred solution to reduce substantially acute stress disorder, post-traumatic stress disorder, and other anxiety related symptoms in combat theatres.

4. Six Pillars of Health Management and the Zero Tolerance Rule

During the past several years, I have published a continuous column approximately titled "Six Pillars Tips for Health Management" in the *Century City News*, on the internet site of the Newport Beach Sunrise Rotary Club, on the website of Kiwanis Club of the Strip (Las Vegas, NV), and on SixPillarTips.com (24th Edition; August 2016). [36, 37, 38] and performed in excess of 2,500 health-related research hours. The Six Pillar Model is the model from which I developed the recommendations in this report. The Six Pillars are:

- (1) The Planning Horizon: Vision building, strategic planning, knowledge accretion, risk assessment, and self-discipline.
- (2) Life style, exercise, and the circadian rhythm.
- (3) Stress and relationship management.
- (4) Reduction of environmental pollution.
- (5) Symptom relief.
- (6) Dietary management including food supplements.

The Six Pillar Model defines stress as "the physical deformation of and interrupted communications between and among cells, organs, and the immune system caused by (1) endogenous negative thoughts and behavior, (2) violations of the circadian rhythm, (3) adverse bodily reactions, (4) environmental contamination, (5) exogenous events (e.g., traumatic events), and (6) heavy exercise all of which contribute to poor cellular, organ, and immune system nutrition and thereby illnesses." [38]

The purpose of the Six Pillar Model is to present a plan for self-administered health management with periodic updates (August 2016 is the 24th edition). Notably, the Six Pillar Model is based upon the "Zero Tolerance Rule" ("ZTR"), not statutory permissible amounts, for all sources of pollution including food pesticides, food additives, indoor air pollutants, electromagnetic fields (EMFs), etc. The ZTR is the basis for the recommended "No Caffeine Rule" for caffeine consumed by DOD personnel.

The reasons for the Caffeine Zero Tolerance Rule are (1) no one is sure of his or her unique tolerance for caffeine until the harmful threshold is passed and one crosses into a state of anxiety, acute stress disorder, panic attack, psychosis, or PTSD, (2) suppliers of harmful products may not adhere to the regulatory concentrations, (3) consumers cannot measure the actual concentrations to evaluate whether the regulatory standard is being met, (4) there are no regulatory standards for caffeine, but caffeine is harmful particularly under stressful conditions, (5) there are no clinical research articles relating grossly excessive stress in combat situation and caffeine to harmful symptoms, and (6) there is adequate reliable evidence presently available to extrapolate the harmful effects of caffeine for civilians to the harmful effects for combat troops with terrible stress levels in Iraq and Afghanistan.

The overall objective of the ZTR rule is to reduce substantially the risk of anxiety/Trauma- and Stressor-Related Disorders (TSRDs) caused by caffeine and to avoid (1) the "maybe this amount of caffeine is OK for me," and (2) stress-related demand elasticity (i.e., increasing consumption during period of stress which adds to stress and other harmful effects). The risk of injury and death from combat

exposure is quite adequate for members of our fighting forces without adding controllable risk from caffeine, refined carbohydrates, and other manageable hazards.

5. Implementing the "No Caffeine Rule" (NCR)

Implementing the NCR will not be an easy task given the prevalence and intensity of use of caffeine-containing foods which include coffee, tea, soft drinks, chocolate, over-the-counter medications, and most recently baked and other foods to which caffeine has been added. But the financial costs and human misery of up to 1.2 million Viet Nam, Iraq, and Afghanistan veterans suffering from PTSD and other anxiety-related disorders is so large, that the NCR must be invoked to reduce these costs in the future.

My recommendations for implementing the NCR for DOD uniformed service personnel and civilian employees with whom they work follow:

Prohibit consumption of the following foods: Coffee, both caffeinated and decaffeinated (because it is not possible to assure that decaffeinated coffee is being used), tea, soft drinks containing caffeine, and dark chocolate.

Set rules for the consumption of over-the-counter medications containing caffeine to assure that they are not being abused to gain access to caffeine. Best to find alternative non-caffeinated products.

Prohibit consumption of caffeinated tablets by members of DOD; I read in a Wall Street Journal article several years ago that combat personnel were being given caffeine pills to stay awake, but I have not been able to find a copy of that article.

For all desk-bound DOD personnel following the NCR, there should be minimum *mandatory exercise for at least 10 minutes every 90 minutes of the workday* (AL10/90 Rule); ten minutes means ten exercise minutes plus time taken to get to and from the beginning and end of the exercise routine. This exercise should entail deep breathing (e.g., brisk walking, stair climbing) to drive oxygen into cells thereby renewing the mind for more efficient work; deep breathing also defeats sucrose cell metabolism, the hallmark of cancer. The AL10/90 Rule is crucial for desk bound personnel to reduce dead spots during which concentration becomes difficult without caffeine. It is also helpful to get to work about 15 minutes early to walk and overcome driving-to-work stress. The benefits of this exercise pattern (at least ten minutes every two hours) is supported by Thayer [39] who found that walking briskly for ten minutes was associated with higher self-rated energy and lower tension than a sugar snack. I estimate that this type of exercise will increase productivity at least 15 percent over the productivity were the NCR enforced and no exercise taken at regular intervals during the day. **Remember, exercise is the caffeine alternative to alertness, high levels of intellectual productivity, and overall health.**

All members of the Department of Defense who work with uniformed military personnel must be included in the NCR prohibition because (1) individuals going from non-combat to combat status should not face withdrawal from caffeinated products when they enter a combat zone, which would create additional stress, (2) all uniformed members of the armed forces should live by the standard of the fighting force to support that effort, and (3) uniformed

members of DOD should not work in the presence of civilian members of the DOD who consume caffeinated products at work.

Recommendation #2: Reduce substantially the amount of refined carbohydrates in the military diet.

Complex and refined carbohydrates

Complex carbohydrates are foods which are starch intensive and are slower to digest reducing glucose spikes and the demand for insulin. Refined carbohydrates have had all of their bran and germ and about two-thirds of other nutrients (fiber, vitamins, and minerals) removed; refined carbohydrates convert to glucose much faster and spike blood sugar and insulin. The carbohydrate-to-sugar conversions is four grams of carbohydrates to one teaspoon of sugar.

Sucrose vs. fructose

Sucrose is the form of sugar that provides energy to body cells. About 80 percent of sucrose is metabolized by cells for energy and is crucial for human life. But fructose, which comes from corn and is usually in the form of "high fructose corn syrup," (HFCS) is cheaper and sweeter, so it is used as a food additive in many products including sodas. HFCS is unhealthy because it is metabolized 100 percent by the liver, furnishes no cellular energy, and starves cells to death in the absence of sucrose. Further, fructose increases uric acid and uric acid leads to cell death, inflammation, oxidative stress, high blood pressure, hypertension, stroke, kidney disease, etc. [40]

Brain cells need about twice the amount of energy as other cells and require about ten percent of total daily energy needs. There are only two sources for brain energy: Glucose or ketones from medium chain triglycerides, the latter of which are not as commonly available (coconut oil is one source). Too much added sugar results in memory impairment and insulin resistance; thus, it is crucial to reduce and preferably eliminate HFCS as an added sugar in the diet because it is nutritionally worthless, harmful for the reasons explained, and may be a substitute for dietary sucrose. [41]

Increases in the per capital consumption of refined carbohydrates (caloric sweeteners)

There has been a large increase in refined carbohydrates and particularly HFCS since the turn of the century. Consumption has increased from 90 lbs/year/US person in 1900 to 129.5 lbs. of caloric sweeteners in the form of refined sugar (66.3 lbs/person), high fructose corn syrup (HFCS, 46.2 lbs/person), other corn sweeteners (15.2 lbs/person), and pure honey and edible syrups (1.8 lbs/person) in 2012. Perhaps most significantly, HFCS, the most harmful form of sweetener, increased from zero in 1967 (total consumption of caloric sweeteners of 114.2 lbs/person) to 46.2 lbs/person in 2012. [42] All of this translates to 27.5 teaspoons of sugar per day or about 25 percent of calories for a 2,000 calorie per day diet. [41]

The harmful effects of refined carbohydrates

The increase in the consumption of refined carbohydrates in the United States has been attended with (1) a reduction in nutrient-dense food, (2) depletion of beneficial vitamins and minerals (3) obesity, and (4) a shift from "economic metabolism" (slow release of sucrose into the blood stream) to "stress metabolism" (rapid release of sucrose for fast energy). Stress metabolism increases emotional stress as well. [43] Sugar increases anxiety because it stimulates the production of adrenaline, upsets blood sugar balances, lowers calcium and magnesium, etc. "Cut-

ting out all sweet foods..." can help prevent certain types of anxiety. [44]

Individuals with a fast metabolism of refined carbohydrates are sensitive to sugar, react with fight or flight mode, aggressive behavior, and acute stress reaction. Stress metabolism is also associated with Attention Deficit Hyperactivity Disorder (ADHD) in children and can usually be cured by removing all refined carbohydrates. Adrenal burnout occurs when one has a sustained stress response triggered by refined carbohydrates and leads to energy burnout. [43] It has been tentatively found that a highly significant relationship exists between sugar consumption and depression in Canada, France, Germany, Korea, and New Zealand, and the United States, [45]

The consumption of sugar-sweetened beverages is highly correlated with weight gain. Approximately eight to nine percent of total energy intake for children and adults is from sugar-sweetened beverages. [46]

Refined carbohydrates increase blood pressure in rats (vs. natural carbohydrates for which there is no increase in blood pressure). [47] Extrapolated to humans, the combination of sugar and caffeine increases blood pressure even more for individuals under stress. In another study of 45 rats for 12 months, it was found that rats fed honey rather than sucrose had less anxiety and better memory in middle age. [48]

Implementation of Recommendation #2 to reduce refined carbohydrates for military personnel

Prohibit consumption of all sodas, caffeinated and non-caffeinated

There is about ¾ teaspoon of HFCS in each oz. of soda beverages. Thus, a 20 oz. soda beverage contains about 16 teaspoonfuls of HFCS. Many of these sodas also contain caffeine with its attendant added adverse health effects. Sale and consumption of caffeinated and non-caffeinated soda should be prohibited on DOD installations (e.g., all training and combat bases and office buildings), and military members of DOD should be educated of the health issues associated with sugar and/or caffeinated beverages and prohibited off duty as well. Civilian DOD personnel in contact with uniformed military personnel should be permitted soda and caffeine consumption after working hours.

Prepare no sugar added (NSA) deserts whenever possible in the food menu of DOD installations.

NSA ice cream and fruit pies taste almost as good as sugared ice cream and fruit pies. Extend the NSA rule to other food choices with a view to reducing the use of sugar to no more than 25 percent of its present use by DOD installations.

Review sugar-intense fruit juice consumption

Many fruit juices have added sugar, which should be viewed with suspicion and avoided. But even fruit juices with NSA are sugar-intense because they do not have the fiber that reduces the glysemic index. I recommend that sugar-intensive fruit juices be prohibited for sale on DOD installations and only NSA fruit juices be permitted for sale. As these policy recommendations evolve, it would be wise to prohibit all fruit juices because of their high glysemic index.

Review candy consumption

Candy is sugar intense and its sale on DOD installation eliminated. Caution must be exercised because implementation of the NCR may encourage military personnel to consume more candy as an offset. Policy review should consider eliminating the sale of candy on military installations.

Recommendation #3: Require seven hours of sleep for all DOD military personnel including those in combat zones.

Tobin, et. al. [35] found that 50.2 percent of the 1,249 combat veterans in the study slept less than five hours. This amount of sleep is generally considered sleep deprivation, which may lead to accidents, reduced cognitive function, hallucinations, headaches, confusion, increased blood pressure and increased risk of cardiovascular disease, increased diabetes risk, irritability, seizures, mania, etc. Clinical research has indicated that sleep disruption contributes to anxiety disorders. [49]

While individual daily combat missions may require less than seven hours sleep, the combat manual should require at least seven hours of sleep for at least 80 percent of combat days monthly. (e.g., 24 days per month).

Recommendation #4: Encourage stress and relationship management with daily metaphysical modeling (meditation)

In order to control stress and negative thoughts, it is helpful to engage in daily metaphysical modeling during which time one engages in positive imaging or working with positive, peaceful ideas or models, which I refer to as "metaphysical modeling."

Those with religious backgrounds may find it best to discuss denominational models with their clergy. Others may wish to use metaphysical models with Yoga.

The starting point is to bring DOD leadership and military clergy together with perhaps private firms that specialize in these activities and produce a tailored program to assist service personnel to engage in metaphysical modeling during stateside and combat tours.

Recommendation #5: Reduce air pollution

There are many sources of potential air pollution to which members of the armed forces are exposed. These may include (1) treatment chemicals in military uniforms, (2) treatment chemicals in soft tents, (3) treatment chemicals in troop transport vehicles, (4) poor air quality in buildings, (4) unfinished wooden furniture, (5) air born chemicals in combat zones, etc.

Air pollution in some combat zones may be very severe [50] and air pollution generally weakens the immune system, causes stress, and probably increases the likelihood of PTSD. Phillips [51] indicated that most Afghanistan housing facilities for U.S. troops contained "...two wooden beds and two wooden wardrobes..." Unfinished wood may be toxic for an undefined period, and manufactured wood products (e.g., plywood) can emit odors for seven to eight years because of the glues that hold the wood particles or sheets together.[52, 53, 54, 55]

Part 3: Recommendations to treat PTSD for afflicted military personnel

I. Scope of treatment recommendations

The scope of my recommendations to treat PTSDVs is limited to alternative and complementary medicine ideas which I believe are not being used, but which may be helpful. They include dietary intervention, earthing, sleep management, swimming with a face mask and snorkel, and home and automobile inspections to improve air quality and eliminate harmful electromagnetic fields (EMFs).

Thus, my recommendations do not include the use of opiate drugs [6], acupuncture [56, 57], cognitive behavioral therapy [58], etc. Opiate drugs are derived from opium poppies and are (1) addictive, (2) lead to overdoses, (3) require little time to write prescriptions, and (4) disregard the underlying symptoms and causes of PTSD.

II. Recommendations to improve PTSD treatment

Treatment Recommendation #1: Dietary intervention

Based upon my contacts with dieticians at two PTSD treatment centers, I have found that neither has dietary intervention for PTSDVs; dietary intervention is available only for non-PTSD symptoms such as over-weight, diabetes, etc. It is highly likely that military personnel are faced with extraordinarily high levels of stress and heavy caffeine and refined carbohydrates use immediately prior to a traumatic event and thereby highly likely that ASD/PTSD originate from anxiety in conjunction with a traumatic event. Thus, some of the treatment options are similar to prevention options. Dietary intervention for anxiety may be effective when caffeine is eliminated and refined carbohydrates are reduced and the Mediterranean or an equivalent diet is set as the standard. [59, 60]

I suggest the following dietary intervention options be employed to treat PTSDVs:

Review the PTSDVs present diet for food allocations among proteins vs. natural and refined carbohydrates, processed vs. non-processed foods, beverages including type of water, food supplements, etc.

Design a participatory plan with PTSDVs to:

Adhere to the Mediterranean or equivalent diet. These diets can be explained in a video and a book given to PTSDVs. Nutritionally, this means increased grass-fed beef, wild fish, free range chicken and eggs there from, fresh organic fruits and vegetables, whole grains, elimination of caffeine and substantial reduction of sugar-intensive foods, heat-altered oils including potato chips, French fries, onion rings, salad dressing, etc., and no sugar substitutes unless they are well researched and approved.

Manage caffeine elimination over a period of up to one month or more depending upon intensity of caffeine use and severity of PTSD symptoms.

Reduce refined carbohydrates.

Eliminate all soft drinks because of caffeine and excess sugar.

Eliminate HFCS.

Manage alcohol consumption

Add probiotics to assure a clean intestinal system to improve mood, depression, and other TSRD symptoms. [61]

Eliminate the use of opioids to set the stage for the use of earthing to relieve pain, improve sleep, and reduce PTSD symptoms.

Periodic review of the actual diet of the PTSDV as a guide for self discipline and dietary improvement.

Prepare for 24/7 monitoring of the dietary suggestions because the reduction of caffeine and refined carbohydrates could have unusual effects on PTSDV symptoms.

Dynamically change the plan as needed for individual cases and in consultation with medical authority.

Treatment Recommendation #2: Introduce earthing to reduce pain, improve sleep, and reduce PTSDV symptoms

Earthing or grounding involves connecting oneself to the earth to get the benefit of the earth's excess electrons transferred to one's body. It's as simple as standing bare foot in the grass or walking barefoot on the sand at the beach. Historically, man lived earthed or grounded, but rubber soled shoes and carpets have disconnected us from the earth and its naturally healing effects. The flow of electrons (1) act as an antioxidant providing missing electrons to oxygen molecules without damaging the donor source, (2) act as an anti-inflammatory for joint and muscle injury, (3) regulate cortisol (i.e., reduces high cortisol and increases low cortisol), and (4) affords better sleep. [62] One earthing option is the use of an earthing bracelet during nighttime sleep. I suggest that medical personnel sleep earthed for several nights so they understand the benefits of this treatment.

I recommend training a PTSDV to sleep earthed with an earthing bracelet nightly for about a week and taking cortisol blood tests before and after the earthing test period; controlled clinical studies must precede wide spread use of earthing because of the unique attributes of PTSD. I am hopeful that earthing may regulate cortisol and other body organs to begin dramatic improvement of PTSD symptoms.

In my opinion, earthing should begin only after opioid use has been discontinued for at least several days. PTSDVs utilizing earthing should provide a daily report describing the quality of their sleep and the severity and frequency of PTSD symptoms.

Treatment recommendation #3: Manage sleep outside of overnight, short-term earthing

Individuals suffering from PTSD are probably unemployed and may be prone to nap during the day. Individuals who experience excess sleep, perhaps hypersomnia (excessive sleep), also are afflicted with anxiety and other medical problems including diabetes, heart disease, and increased risk of death. [63]

Thus, I recommend taking an inventory of sleep patterns with a view to reducing daily sleep to seven to nine hours with no naps.

Treatment Recommendation #4: Swim with a face mask and snorkel

I recommend that PTSDVs swim regularly in late afternoon with a face mask and snorkel in an outdoor pool. I have discovered that swimming in this manner provides a unique feeling of well being. The results of this swim

should also be reported in periodic e-mails.

Treatment Recommendation #5: Inspect the home and automobile for sources of poor air quality and electromagnetic fields (EMFs) with a view to eliminating these contaminants.

It is crucial to the success of the recommendations in this report that each PTSDV have his or her home and automobile inspected for potential sources of poor indoor air quality and EMFs. If these exist and are not eliminated, other treatment programs may well be meaningless.

Good air quality requires frequent cleaning of the air conditioning coils (e.g., 60 days during the summer months in areas with higher humidity) and eliminating air contaminants from personal property; manufactured wood furniture may off-gas contaminants for years.

Sources of EMFs in the home include, but are not limited to, wireless computer technology, cordless and cellular telephones, wireless security systems, remote TV transmitters, microwave ovens, compact and long-tube fluorescent lights, junction boxes, electric stoves, etc. Some of these have a fairly short danger range (e.g., 18 inches) while others may affect an entire room. Cellular telephones may be acceptable if they are used with speaker phone and held about 15 inches from the head, and not carried on or very close to the body.

Part 4: Discussion

This article provides evidence from research studies that caffeine, refined carbohydrates, lack of sleep and metaphysical modeling, and air pollution may contribute to the high incidence of PTSD.

Research studies that I present in this report indicate that caffeine increases anxiety, and, in combination with stress, increases blood pressure, cortisol, the likelihood of panic attacks, psychosis, and abolishes threat-related mPFC wall activation, which is associated with clinical anxiety disorders, including post-traumatic stress disorder. Further, refined carbohydrates contribute to increases in anxiety and blood pressure.

Clinical studies of the positive relationship between caffeine and stress introduce levels of stress that are small in relationship to stress levels of combat personnel suffer in Iraq and Afghanistan; I have found no clinical studies that relate combat stress and caffeine to anxiety disorders. I believe it is proper to extrapolate the effect of caffeine and mild stress in clinical studies to the probable consequences of caffeine and combat stress to causing ASD that ripens into PTSD characterized by anxiety and TSRDs; in essence, I suggest that pre-ASD/PTSD anxiety contribute directly to the incidence of ASD/PTSD. Further, in my opinion, traumatic events on the battlefield are much more likely to induce Acute Stress Disorder (ASD) and later PTSD because (1) combat personnel are adapting to stress by increasing their consumption of coffee, energy drinks, and refined carbohydrates, (2) caffeine and refined carbohydrates elevate the nervous and other body systems toward a state of high alert and anxiety which a traumatic event elevates into ASD and then PTSD, (3) troops are deprived of sleep because of combat requirements and their consumption of caffeine and refined carbohydrates, (4) they do not engage in metaphysical modeling to reduce stress, and (5) they are being exposed to poor air quality. In my opinion, all of these combine to create the The

Devil's Cocktail leading to high rates of ASD/PTSD with a traumatic event.

Recommending *reduction* of caffeine products is futile because these are stress-elastic under combat conditions and because even small amounts of caffeine and refined carbohydrates under extraordinary stress and traumatic events, could trigger ASD/PTSD; notably, Navy SEALs are prohibited from caffeinated products during Hell Week.

It is essential that the No Caffeine Rule be invoked in the attempt to reduce substantially ASD/PTSD. It is my hope that the frequency of ASD/PTSD can be reduced by at least 60 percent with the recommendations in this report. Further, it is crucial to invoke the AL10/90 Rule for all desk bound DOD personnel operating under the No Caffeine Rule to assure high levels of mental activity to perform professional tasks.

The curbs on caffeine and refined carbohydrates must be supported by minimum sleep requirements of seven hours per night at least 80 percent of the combat tour and with a daily program of metaphysical modeling to reduce stress.

For treatment of PTSD, I suggest dietary intervention to eliminate caffeine, reduce refined carbohydrates, manage sleep, engage in earthing to normalize body functions, swim with a face mask and snorkel, and inspect homes and automobiles for poor air quality and electromagnetic fields.

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References:

- [1] American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5)*, American Psychiatric Publishing, Washington D.C.
- [2] American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders-4 (DSM-4)*.
- [3] H. Javidi, and M. Yadollahie, "Post-traumatic Stress Disorder." *Int J Occup Environ Med*, 3(1) (2012), pp. 2-9.
- [4] F.H. Norris and L. B. Stone. "Understanding Research on the Epidemiology of Trauma and PTSD." *PTSD Research Quarterly*, 24(2-3) (2013), 1-5.
- [5] nationalvietnamveteransfoundation.org/dat. June 26, 2014
- [6] T. Catan. "For Veterans with PTSD, A New Demon: Their Meds." *Wall Street Journal*, November 11, 2013, p. A1.
- [7] nsnetwork.org. "The Iraq War Ten Years Later." National Security Network, March 14, 2013.
- [8] K. Alsene, J. Deckert, P. Sand, and H. de Wit. "Association Between A2a Receptor Gene Polymorphisms and Caffeine-Induced Anxiety." *Neuropharmacology*, 28 (2003), pp. 1694-1702.
- [9] L.M. Juliano and R. R. Griffiths. "A critical review of caffeine withdrawal: empirical validation of symptoms and signs, incidence, severity, and

- associated features." *Psychopharmacology* (Berl), 176 (2004), pp. 1-29.
- [10] S. Bolton and G. Null. "Caffeine Psychological Effects, Use and Abuse." *J Orthomol Med*, 10(3) (1981), pp. 202-211.
- [11] A.L. Kristiansson, I. D. Sigfusdottir, S. S. Frost, and J. E. James. "Adolescent Caffeine Consumption and Self-Reported Violent and Conduct Disorder." *J Youth Adolesc*, 42(7) (2013), pp. 1053-62.
- [12] S.M. Seifert, J. L. Schaechter, E. R. Hershorin, and S. E. Lipshultz. "Health Effects of Energy Drinks on Children, Adolescents, and Young Adults." *Pediatrics*, 127(3) (2011), pp. 511-528.
- [13] J.L. Temple. "Caffeine Use in Children: What we know, what we have left to learn, and why we should worry." *Neurosci Biobehav Rev*, 33(6) (2009), pp. 793-806.
- [14] P.J. Rogers, S. V. Heatherley, E. L. Mullins, and J. E. Smith. "Faster but not smarter: effects of caffeine and caffeine withdrawal on alertness and performance." *Psychopharmacology* (Berl), 226(2) (2013), pp. 229-40.
- [15] A.P. Winston, E. Hardwick, and N. Jaber. "Neuropsychiatric effects of caffeine." *Adv Psychiatr Treat*, 11 (2005), 432-439.
- [16] J.F. Greden. "Anxiety or Caffeinism: A Diagnostic Dilemma." *Am J Psychiatry*, 131(10) (1974), 1089-1092.
- [17] J.S. Bonita, M. Mandarano, D. Shuta, and J. Vinson. "Coffee and cardiovascular disease: *In Vitro*, cellular, animal, and Human studies." *Pharmacol Res*, 55 (2007), 187-198.
- [18] R.N. Hughes. "Drugs Which Induce Anxiety: Caffeine." *NZ J Psychol*, 25(1) (1995), pp. 36-42.
- [19] J.E. Smith, A. D. Lawrence, A. Diukova, R. G. Wise, and P. J. Rogers. "Storm in a Coffee Cup: Caffeine Modifies Brain Activation to Social Signals of Threat." *Soc Cogn Affect Neurosci*, 7(7) (2012), pp. 831-840.
- [20] E.M. Drabant, K. McRae, S.B. Manuck, S.B. Hariri, and J.J. Gross. "Individual Differences in typical reappraisal use predict amygdale and prefrontal responses." *Biol Psychiatry*, 65(5) (2009), pp. 367-73
- [21] K. McRae, B. Hughes, S. Chopra, J.D.E. Gabrieli, J.J. Gross, and K.N. Oshsner. "The neural basis of distraction and reappraisal." *J Cogn Neurosci*, 22(2) (2010), pp. 248-62.
- [22] J.J. Radley, M. Kabbei, L. Jacobson, W. Heydendaal, R. Yehuda, and J. P. Herman. "Stress Risk Factors and Stress-Related Pathology; Neuroplasticity, Epigenetics, and Endophenotypes." *Stress*, 14(5) (2011), pp. 481-497.
- [23] T.B. Hartley, W. R. Lovollo, T. L. Whitesett, Bong Hee S., and M. F. Wilson. "Caffeine and Stress: Implications for Risk, Assessment, and Management of Hypertension." *J Clin Hypertens*, 3(6) (2001), pp. 354-382.
- [24] C. France and B. Ditto. "Caffeine Effects on Several Indices of Cardiovascular Activity at Rest and During Stress." *J of Behav Med*, 11(5) (1988), pp. 473-482.
- [25] C. France, and B. Ditto. "Cardiovascular Responses to the Combination of Caffeine and Mental Arithmetic, Cold Pressor, and Static Exercise Stressors." *Psychophysiology*, 29(1) (1992), pp. 272-282.
- [26] I.B. Goldstein and D. Shapiro. "The Effects of Stress and Caffeine on Hypertensive's." *Psychosom Med*, 49(3) (1987), pp. 226-235.
- [27] J.D. Lane, B. G. Phillips-Bute, and C. F. Pieper. "Caffeine Raises Blood Pressure at Work." *Psychosom Med*, 60 (1998), pp. 327-330.
- [28] W.R. Lovallo, N. H. Farag, A. S. Vincent, T. L. Thomas, and M. F. Wilson. "Cortisol responses to mental stress, exercise, and meals following caffeine intake in men and women." *Pharmacol Biochem Behav*, 83 (2006), pp. 441-447.
- [29] J.D. Shepard, M. al'Absi, T.L. Whitsett, R.B. Passey, and W.R. Lovallo. "Additive pressor effects of caffeine and stress in male medical students at risk for hypertension." *Am J Hypertens*, 13(5 Pt. 1) (2000), pp. 475-81.
- [30] S.F. Crowe, J. Barot, J. D'Aspromonte, J. Dell'Orso, A. Di Clemente, K. Hanson, M. Kallett, S. Makhota, B. McIvor, L. Mc Kensie, R. Norman, A. Thiru, M. Twyerould, and S. Sapega. "The effect of caffeine and stress on auditory hallucinations in a non-clinical sample." *Pers Individ Dif*, 50(6) (2011), pp. 626-630.
- [31] B. De Freitas and G. Schwartz. "Effects of Caffeine on Chronic Psychiatric Patients." *Am J Psychiat*, 136(10) (1979), pp. 1337-1338.
- [32] R. Whalen. "Caffeine Anaphylaxis: A Progressive Toxic Dementia." *J Orthomol Med*, 18(1) (2003), pp. 25-28.
- [33] J. James. "Caffeine Consumption and Combat Stress Amongst Military Personnel: An Interview with Alison Lighthall: In My Opinion." *J Caffeine Res*, 1(1) 2011, pp. 13-14.
- [34] H.R. Lieberman, W. J. Tharion, B. Shukitt-Hale, K. L. Speckman, and R. Tulley. "Effects of caffeine, sleep loss, and stress on cognitive performance and mood during U.S. Navy SEAL training." *Psychopharmacology* (Berl), 164 (2002), pp. 250-261.
- [35] R.L. Toblin, K. Clarke-Walper, B. C. Kok, M. L. Sipos, and J. L. Thomas. "Energy Drink Consumption and Its Association with Sleep Problems Among U.S. Service Members on a Combat Deployment-Afghanistan, 2010." *MMWR Morb Mortal Wkly Rep*, 61(44) (2012), pp. 895-898.
- [36] H. Kelting. "Six Pillar Tips for Healthy Living." NewportBeachSunriseRotaryClub.org/Our Projects/ClubService.org, (13th Edition, April 2014).
- [37] H. Kelting. "Digestive and Systematic Enzymes." NewportBeachSunriseRotaryClub/Our Projects/ClubService.org, (2013).
- [38] H. Kelting. "Six Pillar Tips for Health Management." SixPillarTips.com (24th Edition, August 2016).
- [39] R.E. Thayer. "Energy, tiredness, and tension effects of a sugar snack versus moderate exercise." *J Pers Soc Psychol*, 52(1) (1987), pp. 119-125.
- [40] J. Mercola. "Fructose: This Additive Commonly Used Food Feeds Cancer Cells, Triggers, Weight Gain, and Promotes Premature Aging." *Mercola.com*, April 20, 2010.
- [41] D. DiSalvo. "What Eating Too Much Sugar Does to Your Brain." *Psychol Today*, (April 27, 2012).
- [42] United States Department of Agriculture. "Sugar and Sweeteners Yearbook 2012: U.S. Consumption of Caloric Sweeteners, Table 50: "U.S. Per Capita caloric sweeteners estimated deliveries for domestic and beverage use by calendar year."
- [43] T. Rasmussen. "Sugar Stress: How Our Diet Impacts Vision and Development." *Journal of Behavioral Optometry*, 23(5-6) (2012), pp. 156-159.
- [44] L. Wilson. "Anxiety and Panic Attacks-Their Causes and Correction." The Center for Development, www.drlwilson.com/articles/anxiety.htm, (Sept 2012).
- [45] A.N. Westover and L. B. Marangell. "A Cross National Relationship Between Sugar Consumption and Major Depression?" *Depress and Anxiety*, 16 (2002) pp. 118-120.
- [46] V.S. Malik, M. B. Schulze and F. B. Hu. "Intake of sugar-sweetened beverages and weight gain: A systematic review." *Am J Clin Nutr*, 84(2) (2006), pp. 274-288.
- [47] R.D. Fournier, C.C. Chiuieh, I. J. Kopin, J. J. Knapka, D. DiPette, and H. G. Preuss. "Refined carbohydrate increases blood pressure and catecholamine excretion in SHR (hypertensive) and WKY (normotensive)." *Am J Physiol*, 250(4 Pt 1) (1986), pp. E381-E385.
- [48] L. Chepulis, N. J. Starkey, J. R. Waas, and P. C. Molan. "The effects of long-term honey, sucrose or sugar-free diets on memory and anxiety in rats." *Physiol and Behav*, 97(3-4) (2009), pp. 359-368.
- [49] A.N. Goldstein, S. M. Greer, J. M. Saletin, A. G. Harvey, J. B. Nitschke and M. P. Walker. "Tired and Apprehensive: Anxiety Amplifies the Impact of Sleep Loss on Aversive Brain Anticipation." *J Neurosci*, 33(26) (2013), pp. 10607-10615.
- [50] Kesling, B. "Soldiers Battle Lung Trouble." *Wall Street Journal*, November 9-10, 2013, p. A3.
- [51] M.M. Phillips. "Marking Time in an Afghanistan Barracks." *Wall Street Journal*, December 21-22, 2013, p. A11.
- [52] S.N. Wellborn, "Toxic Woods: A List of woods that are known to cause allergic, toxic, infectious, or respiratory reactions." www.finewoodworking.com. January 13, 2014.
- [53] Environmental Protection Agency. "An Introduction to Indoor Air Quality (IAQ): Formaldehyde." www.epa.iaq/formaldehyde.html. January 13, 2014.
- [54] D. Robson. "What can formaldehyde do to you? New construction, mobile homes and formaldehyde." www.itum-net.com/www/mag/article.asp?id=49. (Sept 2014).
- [55] A.T. Hodgson, A.F. Rudd, D. Beal, and S. Chandra. "Volatile organic compound concentrations and emission rates in new manufactured and site-built houses." *Indoor Air*, 10(3) (2000), pp. 178-92.
- [56] M. Hollifield, N. Sinclair-Lian, T.D. Warner, and R. Hammerschlag. "Acupuncture for posttraumatic stress disorder: a randomized controlled

pilot trial" J Nerv Ment Dis, 195(6) (2007), pp. 504-13.

- [57] Young-Dae K., In Heo, Byung-Cheul S., C. Crawford, Hyung-Won K., and Jung-Hwa L. "Acupuncture for Posttraumatic Stress Disorder: A Systematic Review of Randomized Controlled Trials and Prospective Clinical Trials." Evid Based Complement Alternat Med, 2013 (2013): 12 pages.
- [58] Wikipedia.org/wiki/Cognitive_Behavioral_Therapy, June 30, 2014.
- [59] D.K. Hall-Flavin, "Is it true that certain foods worsen anxiety and others have a calming effect?" www.mayoclinic.org/diseases-conditions/generalized-anxiety-disorder/expert-answer. February 13, 2014.
- [60] Newsmax.com. "Acute Stress Disorder: How Diet Plays a Role." www.newsmax.com/FastFeatures/acute-stress-disorder-cures/2010/10/06/id/372766, October 6, 2010.
- [61] D.G. Williams, "Why Mood Disorders Should be Treated from the 'Bottom Up'." Alternatives, (February 2014): 1-4.
- [62] C. Ober, S. T. Sinatra, and M. Zucker. *Earthing The Most Important Health Discovery Ever?* Basic Health Publications, Laguna Beach, CA: 2010.
- [63] WebMD. "Physical Side Effects of Oversleeping." *Sleep Disorders Health Center*. www.webmd.com/sleep-disorders/guide/physical-side-effects-oversleeping. February 26, 2014. Corresponding author: 702.527.5932