

The Medicine Wheel

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Accidents, violence, and certain chronic diseases kill American Indians greatly out of proportion to other racial groups. Complex interactions between previously adaptive survival mechanisms, historical and cultural factors, and U.S. policy must be understood to respond effectively to these health issues. The traditional medicine wheel provides a conceptual framework that is culturally grounded and also supported by solid scientific research. Research related to complex neuroendocrine and behavioral responses to the stressors of life provides a basis for effective treatment programs for American Indians.

Keywords: Native Americans; traditional medicine

Accidents, homicide, and suicide kill American Indian children and youth in far larger numbers than any other racial group. Later in life, heart disease, chronic liver disease/cirrhosis, and diabetes kill Indian adults greatly out of proportion to other groups. Lung cancer is increasing among Indians, but even though Indians smoke more than any other group (Indians 40%, all races 25%), they have usually suffered and died of other maladies before developing lung cancer. Smoking, of course, complicates the other causes of death. American Indians also have the highest incidence of alcoholism of any racial group (Shalala, Trujillo, Hartz, & Paisano, 2001).

The experience of reading statistics on death and disease among Indians is similar to that of reading about a fourth-world country in the news. Yet because these numbers are not “statistically significant” to the United States as a whole, they are seldom seen. Indians have become accustomed to hearing statistics regarding other racial groups and noting that although their own disease and death numbers are far greater, Indian numbers are most often ignored.

American Indians have higher rates than any other U.S. group of the following:

- accidents, suicide, homicide (non-Indians against Indians);
- violent crime and domestic violence (mostly non-Indian against Indian);
- alcohol and nicotine abuse;

Author's Note: The terms “American Indian” or “Indian” will be used throughout because this is what the indigenous peoples call themselves.

Journal of Transcultural Nursing, Vol. 17 No. 3, July 2006 251-260
DOI: 10.1177/1043659606288383
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- type 2 diabetes with related cardiovascular disease;
- depression and posttraumatic stress disorder (PTSD);
- unemployment, poverty, and school dropout. (Stone, 2005)

This article focuses on the use of the medicine wheel as a conceptual framework and integrative approach to respond to the issues of health and wellness of American Indians. It reviews the traditional medicine wheel, historical roots of disease, research related to the stressors of life, and examples of changes needed to help enrich the health of Indians.

TRADITIONAL MEDICINE WHEEL AND ITS PHILOSOPHICAL OVERVIEW

There are a variety of medicine wheels used by different tribes for different purposes. What Indians call the “medicine wheel” is a universal symbol known in psychology as the Jungian mandala—a symbol of wholeness. The particular medicine wheel used in our mental health facility includes all races, all life—including two-leggeds, four-leggeds, winged things, plants, and medicines (see Figure 1). All are considered sacred and equal. This is related to the philosophy of Mitakouye Oyasin, a phrase that comes from a Lakota prayer, which translated means, “All my relations” or “We are all related” (Tinker, 1996, p. 158).

The medicine wheel includes all directions and the four aspects—mental, emotional, physical, and spiritual. No one aspect is complete. It combines Eastern and Western philosophies. Eastern philosophy tends to be cyclical, with the sense that what has been will be, where change is not possible. Western philosophy assumes linear cause and effect and is interventionist. Thus, the medicine wheel includes cycles, seasons, and passages but also assumes that change can and will occur. Through the medicine wheel, we learn that if we focus on or become stuck in the mental, emotional, physical, or the spiritual, we lack wholeness in all aspects. It is important to work on achieving health, positive change, and growth in each aspect for balance and wholeness.

HISTORICAL ROOTS OF DISEASE IN INDIANS

To understand the statistics on death and disease among Indians, it is important to have background information that most U.S. citizens do not have. In 1492, there were more than 75 million native people in the Western hemisphere, with at least 6 million residing in what is now called the United

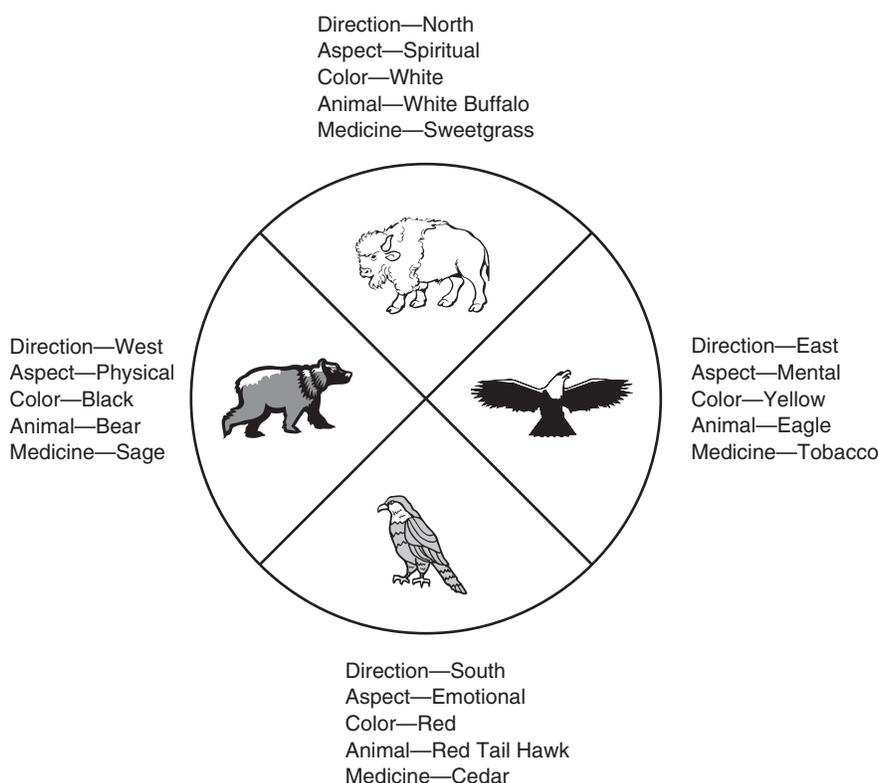


FIGURE 1. The Medicine Wheel.

States. They spoke 2,000 languages and had long been thriving civilizations. Some scholars have estimated that the North American Indian population was between 12 million and 18 million before European arrival and was reduced to 300,000 to 400,000 by 1900 (Campbell, 1994; Stiffarm, 1992; Thornton, 1987). Whole tribes became extinct. And because there were more deaths than births between 1492 and the end of the 19th century, a simple subtraction of numbers is not sufficient to comprehend the enormity of the losses. Many times the remaining number actually died (Thornton, 1987).

Although a majority of American Indian deaths were the direct result of diseases to which they had no immunity, the deaths were not as innocent as has been portrayed. There can be no doubt that by this time in history, people knew that removing food and shelter predisposed humans to disease and death. General Amherst wrote, "You will do well to inoculate the Indians by means of blankets as well as to try every other method that can serve to extirpate this execrable race" (Weslager, 1996, p. 245). There is endless documentation of the burning of Indian crops and villages, or what Thornton (1987) has called the "scorched-earth policy." General Sheridan ordered the extermination of 60 million buffalo for the stated purpose of denying subsistence to the Plains Tribes. In addition, tribes were constantly moved and forced

on long "removals," with resulting illness and death. Large numbers were killed in massacres, and cash bounty was often posted for the delivery of "redskins." Indians were killed for sport, which included the taking of testicles and vaginas for souvenirs (Stannard, 1992). There were 19th-century published appeals for complete extermination (Campbell, 1994; Stiffarm, 1992; Thornton, 1987). After the original physical genocide came the public policy, strongest between 1880 and 1934, of cultural genocide or ethnocide, in which Indian children in the United States, as with other indigenous children in other times and places around the globe, were taken from their homes, made to attend boarding schools, prevented from speaking their native languages, and forced to learn the ways of the dominant culture (Dapice, 1997). In the United States, this process, epitomized by the work of Richard Henry Pratt, was seen as raising the "savage" to the level of "civilized society" (Rausch & Schleppe, 1994). But a phrase that continued to be heard by Indians growing up in the 20th century summarizes the U.S. policy in general, paraphrased from General Sheridan: "The only good Indian is a dead Indian" (Duffy, 1951, p. 326).

Although invisible to dominant culture, racism against American Indians continues in a variety of ways, both individual and institutional. The word "invisible" is a critical

component in understanding this form of racism because Indians become used to not being seen or observed—as the facts of their reality don't appear in most descriptions of different racial statistics. Indians look in vain for themselves in U.S. numbers that most typically list African Americans, Caucasians, Hispanics and "others." The use of mascots with Indian names and symbols in sports arenas turn Indians into cartoons, as "pretend Indians" run across football fields defiling sacred ceremonies. This practice is only trumped by the protest of dominant culture editorials that "next they'll say that cauliflower can't be used as a mascot and political correctness has gone too far." Even in universities, Indians are the last group to have scholarly programs that examine their history, present, and future. When such programs do exist, non-Indians most often teach in them.

There is little recognition that the history of near extermination, cultural genocide, land loss, oppression, ongoing racism, and poverty are related to not only emotional, spiritual, and mental disease but also physical disease. These are the result of complex interactions between previously adaptive survival mechanisms, pre-Columbian culture and diet, and include past and present U.S. policy (Dapice, Inkanish, Martin, & Brauchi, 2002).

RELATED GENETIC AND ADAPTATION RESEARCH

Processes formerly necessary for our safety and well-being that work together are (a) the so-called "thrifty gene" and (b) mechanisms for fight and flight. These now serve to make and keep us ill. Our bodies and brains continue to function according to hunting and gathering needs that were appropriate thousands of years ago.

Contrary to expectations, skeletons exhumed 10,000 years ago on this continent were seen to be healthier than those found since horticulture began (Steckel & Rose, 2002). Early humans stored food substances through the production of insulin in response to carbohydrates. This allowed for fat storage in the body for winter and famine. Similarly, the body and mind sought to limit the amount of energy expended through physical activity. One ate large amounts when foods were available and exercised only as needed for existence.

The benefits of civilization have yielded mass production and preservation of foods, tobacco, and other substances through agriculture, the industrial revolution, and global transportation. Substances such as tobacco, once rare and localized to a particular area, required first slave labor, then industrialized technologies, to produce in amounts sufficient for addiction. Tobacco, once scarce and used for ceremony only, is now plentiful, used in addictive ways, and kills in large numbers worldwide.

Meanwhile, the United States is a nation of substance abusers. Substance-abuse-related deaths are the most preventable cause of death in this country. Recent figures show

that, in order of impact, nicotine addiction, obesity, alcohol abuse, and illegal drug use are the most preventable causes of illness, injury, and death. Beyond mortality rates lies the illness and suffering related to substance abuse—mental, emotional, physical, spiritual, and social. In 2001, the Robert Wood Johnson Foundation declared substance abuse the nation's number-one health problem. Noting that substance abuse causes more deaths, illnesses, and disabilities than any other preventable health condition, the foundation noted that substance abuse, not including obesity, costs the nation more than \$410 billion a year, according to health care and justice records.

Food and tobacco are connected to other addictive substances in important evolutionary and physiological ways. Although tobacco use remains in first place with respect to fatal forms of substance abuse, obesity is rapidly moving ahead as a cause of death (Tanner, 2004). Recent research demonstrates that brain circuits involved in drug addiction are also activated by the desire for food. The right orbital-frontal cortex is involved in compulsive behaviors characteristic of addictive states, and this same brain region is activated when addicted individuals crave drugs such as cocaine. Food stimulation increases the levels of dopamine, and when obese individuals were examined, they were found to have fewer dopamine receptors—as has been found in addiction to other substances (Brookhaven National Laboratory, 2004). It is, of course, important that food be satisfying for the survival of the species. Having fewer receptors may serve to increase the level of food intake, when possible, and this would have once been adaptive to prepare for winter months or times of famine—and still would be in some parts of the world today. Food-intake regulation is a complex issue, but this research is important to consider given the prevalence of obesity in the modern world—especially in the Indian population.

Although a third of the nation's 50 million smokers attempt to quit each year, not unlike statistics on treatment effectiveness in alcohol and drug addiction (Mathews-Larson, 1991), fewer than 5% succeed. Carl Anderson, researcher at Harvard University Medical School, reported in a conversation a year ago that the amino acid, L-Glutamine, is missing in the brains of smokers but not in the brains of those who can take or leave tobacco products. L-Glutamine also helps regulate blood sugar and related cravings for carbohydrates and alcohol (Mathews-Larson, 1991).

Alcoholism among American Indians is partly related to lack of adaptation to certain foods. Alcoholism is highest among peoples who received grains such as wheat, barley, and oats relatively late—Russians and northern Europeans. American Indians have had even less time to adapt to these foods (Mathews-Larson, 1991).

EEG brain waves are shaped genetically, and researchers have demonstrated that reduced amplitude correlates with alcohol dependence and have identified the chromosomal region that affects the P300 electrical brain wave, already

correlated with alcohol craving and predisposition to relapse. These abnormalities are true both of alcoholics as well as their “alcohol-naïve” (never used) offspring (Begleiter & Porjesz, 1988; Propping, Kruger, & Mark, 1981; Tabakoff & Hoffman, 1988; Volavka, Pollock, Gabrielli, & Mednick, 1985). Studies at the University of Connecticut by Dr. Lance Bauer (2001) show that relapse to alcohol, cocaine, and opioid dependence can be predicted by brain waves. The high-frequency activity on EEGs was found to far outweigh clinical and demographic variables as a predictor of relapse (Bauer, 2001). Alcoholic P300 brain waves appear as “jagged mountains” compared to the normal appearance of gentle “foothills.”

Research also shows that hypoglycemia affects up to 95% of alcoholics, causing them to become irritable, angry, depressed and hostile and to crave carbohydrates in the form of food or alcohol. Consuming carbohydrates in various forms serves to relieve symptoms temporarily. With surges of insulin, the cycle continues. This is known as “dry drunk” in the alcoholic community and may be observed whether or not individuals have ever used alcohol. Diabetics often experience these same hypoglycemic symptoms and are taught how to respond appropriately with diet (Bell & Martin, 2002; Dapice, Inkanish, Martin, & Montalvo, 2001; Mathews-Larson, 1991).

As introduced before, the physiological process that protected our ancestors from predators is the fight-or-flight mechanism. Human responses to physical and psychological threats seem not to have changed since our ancestors were hunting large animals. We humans survive periodic threats and challenges by maintaining homeostasis—a delicate, dynamic equilibrium. If that harmony is disrupted, neural and biochemical events in the brain and the endocrine and immune systems are jolted into action to counter the effects of the physical or psychological stressor—and to reestablish homeostasis. If such homeostasis is not reset, debilitating illness results (Dapice et al., 2002).

When we are threatened, a series of responses occur that prepare us for fear, fight, and flight. Physiological processes related to conservation and restoration of energy are put on hold. The normal response to stress involves the hypothalamic-pituitary-adrenal (HPA) axis—the hypothalamus, pituitary, and adrenal glands. When exposed to a stressor, neurons in the hypothalamus release CRF (corticotropin-releasing factor), which in turn causes the pituitary gland to release ACTH (adrenocorticotropin hormone). ACTH then stimulates the adrenal cortex to release cortisol, which influences the body’s response to stress (Golier & Yehuda, 1998).

Once the threat is addressed, the body returns to homeostasis and the brain is relaxed through the inhibition of several chemicals (the neurotransmitters serotonin, norepinephrine, and dopamine). If the threat is not removed, a stress cycle develops in which more cortisol is produced, causing further problems. A permanent state of stress homeostasis then occurs,

which impairs our immune systems, decreases our bone density, weakens our muscles, increases heart and vascular diseases, and lowers our resistance to diabetes. Thus, the mechanism meant to protect us becomes destructive when such actions are inappropriate to the situation or when the stress or danger becomes chronic. Cortisol (produced during these times) becomes toxic to cells in the body and the brain, killing brain cells and leaving depression in its wake (Sapolsky, 2000).

As noted by the National Institute of Drug Abuse (NIDA, 2002), studies in the journal *Psychoneuroendocrinology* indicate the following:

1. Stress and cortisol sensitize animals for drug-seeking behaviors and facilitate self-administration.
2. Animals under-aroused with low levels of cortisol are more prone to develop drug-seeking behaviors.
3. Severe stress early in life induces a series of physiological, neurobiological, and hormonal events that result in dysregulation of biological reward pathways in the central nervous system and in stress-response systems; these changes seem to prompt self-administration of drugs and alcohol later in life.
4. Prenatal exposure to stress and drugs predispose animals to drug-seeking behaviors in adulthood.
5. PTSD is a risk factor for substance abuse.
6. The administration of cocaine to humans causes similar physiological reactions as the secretion of adrenaline and cortisol and psychological reactions similar to arousal caused by stress.

In modern life, stress is not limited to oppressed and powerless individuals and groups. PTSD resulting from traumatic events continues the effects of the stress over time, with a cycle of cortisol production resulting in depression. PTSD patients typically continue to re-experience a trauma, demonstrating hyperarousal, irritability, insomnia, and inability to concentrate (Bremner et al., 2000). Studies also show the loss of hippocampal volume in major depression. Bremner and colleagues have demonstrated this same volume loss in PTSD related to childhood physical and sexual abuse (Bremner, Randall, Vermetten, Staib, & Bronen, 1997). Cortisol may become depleted after continued stimulation. Children born to mothers with low cortisol levels have often been found to have low cortisol levels as well (Duran & Duran, 1995; Yehuda et al., 1995). In fact, children who are bullies and violent prison inmates are found to be low in cortisol (MacKeen, 2000). In his recent book, *Nearness of Grace*, Arnold Mandell (2005), writes that exaggerated pruning of unused neural connections as a result of high levels of stress hormones, leads to an extremely reduced range of potential behavior, which results in individuals “who lie without reason, get drunk, binge on promiscuity, steal unneeded things, or withdraw into interpersonal isolation” (p. 30).

Child abuse, neglect, sexual abuse, and verbal abuse cause damage to the cerebellar vermis in the brain, causing

electrical irritability that the brain attempts to quell physiologically and that the individual attempts in adulthood to alleviate by abuse of alcohol and drugs. This area of the brain is extremely sensitive to stress hormones (Anderson et al., 1999). Brain-imaging technology (Teicher, 2002) demonstrates that there are three major changes observed in the brains of adults who were abused as children, as follows:

- limbic irritability with increased incidence of clinically significant EEG abnormalities,
- deficient development of the left hemisphere of the brain (throughout the cerebral cortex and hippocampus), and
- deficient integration of the left and right hemispheres of the brain, with diminished development of the middle portions of the corpus callosum that serves as a bridge connecting the left and right brain.

These lateralization changes in the brain are similar to those found by many other PTSD researchers. Essentially, the right brain takes control with negative affect and related behaviors (Bremner et al., 2000; Dapice et al., 2002; Sapolsky, 2000). However, the cerebellum has the potential architecturally to continue communication between the left and right brain using electrical stimulation (C. M. Anderson, personal communication, September 2003). Anderson (2001) has also noted a convergence of data suggesting that abnormalities in the cerebellar vermis may be involved in a wide array of psychiatric disorders including depression, substance abuse, and attention deficit hyperactivity disorder.

ISSUES IN INDIAN HEALTH CARE

The backdrop of the present health situation in the Indian world is that of genocide, cultural genocide, land loss, forced assimilation, racism, and poverty (see Figure 2). Once thought to be social issues that could be readily overcome, research increasingly demonstrates that, when damage is done, it affects all aspects of human life—the mental, emotional, physical, and spiritual. Oppression, racism, and the highest rates of poverty continue constant stress that causes demand on the individual as well as the group.

In terms of the mental aspect, this history has resulted in the loss of teaching elders and of experiential learning. Once, all humankind learned alongside their family and elders what they needed to know in life. Classrooms for learning are relatively recent, and although we educators talk about the need for experiential learning, we too often limit this to science labs in schools. The use of boarding schools to force assimilation—used worldwide on indigenous peoples—caused education to become devalued for Indian children and families. Tribal languages, culture, and religions were lost, and the separation of children from their families led to a fear of education that lasts to the present. Children growing up in church-run boarding schools did not learn parenting skills, only how to exist in an authoritarian institutional setting. Use

of alcohol by Europeans to make treaties to their liking, and to take land from Indians, resulted in high levels of alcoholism that eventually caused cognitive damage to the brain. Chronic stress from ongoing stressors leads to brain damage, resulting in what can now be verified by brain imaging as measurable loss of brain volume related to anxiety, depression, and PTSD.

Identity has been the major loss in the emotional aspect. Indians once learned their identities from families and tribal ceremonies, but boarding schools, used by the U.S. government to enforce assimilation, taught Indians to be as “White” as possible in dress, language, customs, and religious beliefs. In a very real sense, this loss of identity occurs today when statistics in the media list only other racial or ethnic groups and Indians are systematically missing. Indians are invisible. U.S. history books most often begin with the coming of Europeans to this continent.

In the physical aspect is loss of what were once strong bodies. Early records written by Europeans note that Indians were tall and strong compared to Europeans. As noted earlier, skeletal studies of Indian remains 10,000 years ago showed them to be healthier than they are today. No longer able to hunt and gather freely over extensive areas, Indians were limited to reservation lands considered less desirable by Europeans and given commodities that were not typical hunter-gatherer food. The result was so-called “traditional” recipes, such as fry bread and grape dumplings, that were never traditional—but rather the result of Indians doing the best they could with commodities received. Tobacco, once a medicine for sacred use only, became a social and addictive substance now readily available. Alcohol, made of substances to which Indians were not adapted (Mathews-Larson, 1991), became a constant companion for many. Obesity, diabetes, and cardiovascular disease, once unknown to Indians, result from a large supply of consumables for which human fat storage for famine is no longer adaptive. The Holocaust studies apply to Indians as well, affecting generations who did not directly experience genocide. Past and ongoing stresses, with related damage, affect Indian brains and bodies. (Because of lack of EEG and brain-imaging studies in the American Indian population, it is not known to what extent alcoholism and other illnesses are genetic and to what extent the illnesses are the result of ongoing acute and chronic stress.)

Losses in the spiritual direction result from the banning of ceremonies that were once central to existence. Indian ceremonies were seen by European Christians to be heathen. Well “Christianized Indians” continue to believe this. Families, clans, and tribes have become divided between Christian and traditional beliefs. Often, attitudes related to European Christian influence (including the reduced roles of children and women) have become confused as “Indian tradition” with devastating results. Attempts to combine Christian and tribal belief systems into one result in even more incongruity. Indian survival has too often become one of hopelessness, despair, and desolation.

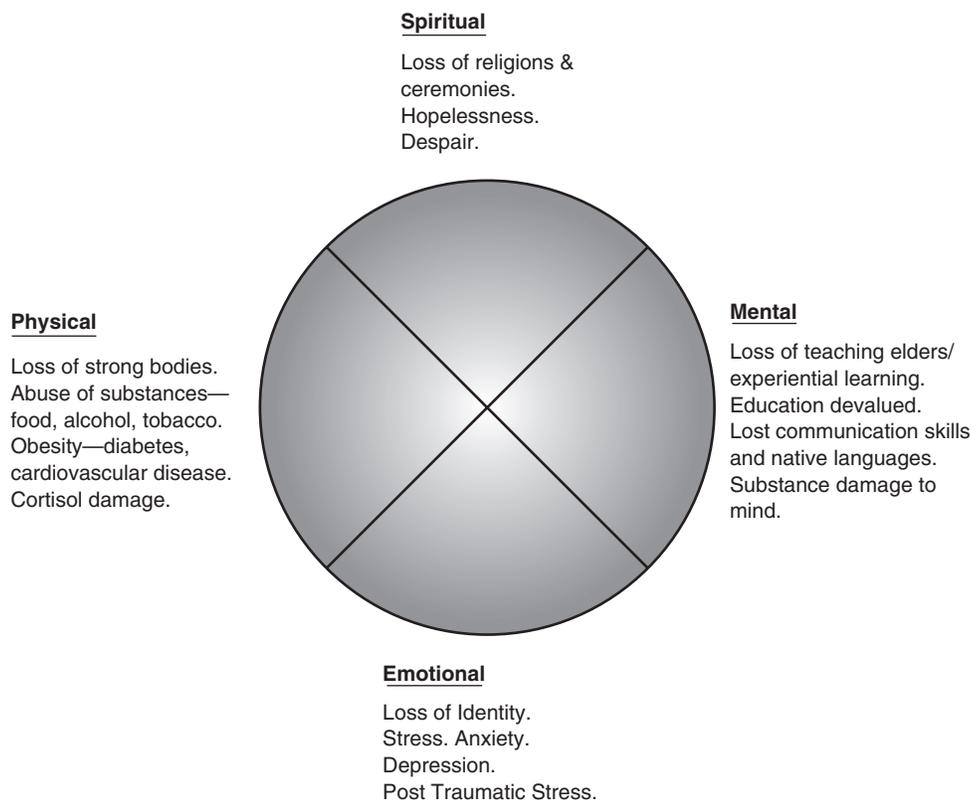


FIGURE 2. Backdrop to Present Health Conditions.

NOTE: Major losses combine with once-adaptive survival mechanisms to cause mental, emotional, physical, and spiritual illness. Shaded areas in the medicine wheel represent losses sustained.

These combined losses have led to the present situation in which American Indians suffer the highest numbers of preventable disease, such as suicide, homicide, domestic violence, and accidents of any group in the United States.

CHANGES NEEDED

Using Mental, Emotional, Physical, and Spiritual Aspects as a Guide

For the mental aspect, elder and experiential learning is needed (see Figure 3). This has been taking place in Indian country for a number of years now. There are elder-youth conferences where elders pass on knowledge to the young in everything from growing corn, beans, and squash, to learning traditional games and cultural stories. Some tribes have language programs led by elders who still have knowledge of their languages. A challenge in Indian Country is that the traditional notion of respecting elders conflicts with the reality that many elders, grandparents, and great-grandparents have ongoing substance-abuse problems. Language and culture preservation are losing out to addiction. Indians have the highest school-dropout rates of any group yet typically

have strong scores on achievement tests. Old fears of education have to give way to encouraging the young to stay in school. Indians must participate in the re-education of everyone about history, Indian and non-Indian—especially when history has been described and dictated by the winners. Learning-style testing using Myers-Briggs (1980) Type assessment is helpful because testing indicates that compared to the dominant culture, Indians show some distinct differences in predominant psychological types and learning styles.

In terms of the emotional aspect, physical repair of brain damage from chronic stress and PTSD is crucial. As noted above, new brain science and technology allow us to see connections between these and addiction, anxiety, and depression. Counseling and art therapy must be culturally competent and thus related to communication styles, body language, cultural symbols, and beliefs. The learned techniques of middle-class, dominant culture counselors are often inappropriate to the realities of Indians and other minorities.

As far as the physical aspect, education is required regarding diet and exercise appropriate to that of client ancestors. It is important to discuss with clients the specific kinds of foods that tribes ate before European conquest. It is also necessary

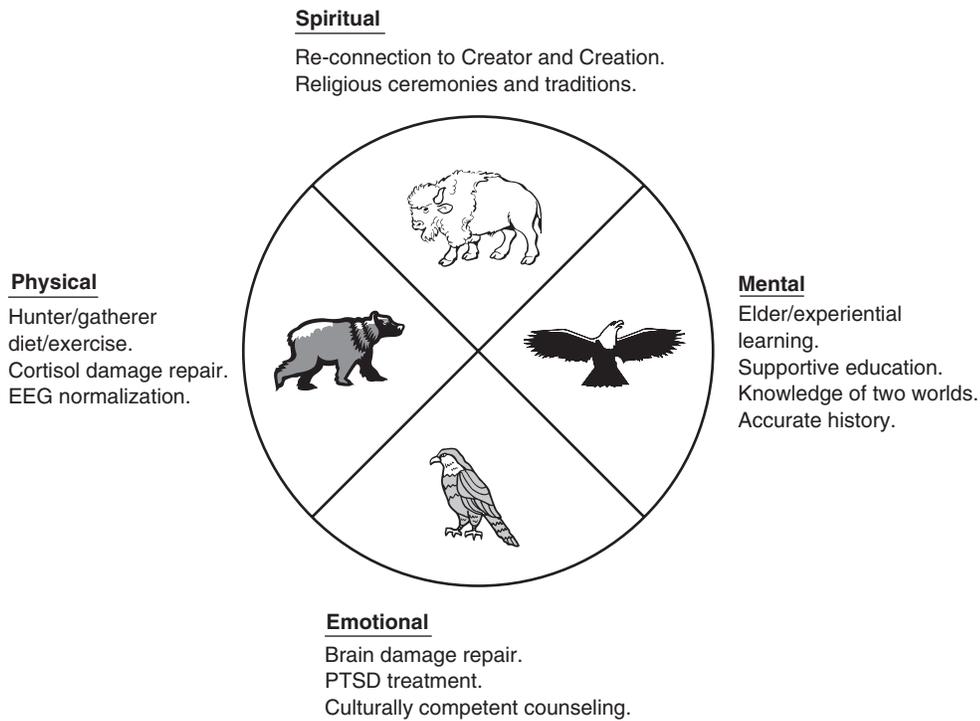


FIGURE 3. Medicine Wheel Changes Needed.

to understand that depressed people do not feel like exercising but will exercise when they begin to feel better. The most effective way that our mental health and addiction facility has found to restore stress damage to the brain is through EEG normalization. External means that help clients feel better are necessary before they can make independent healthy changes. Only then will clients exercise and eat a better diet.

For the spiritual aspect, it is important to encourage reconnection to creation, the earth, the sky, and nature—to perceive the beauty, awe, and wonder that surrounds us. These are the experiences that give us healthy vision for the present and the future. It is important to know that although Indian ceremonies are no longer banned, the simple resumption of ceremonies by people who are addicted, anxious, angry, and depressed will not yield health. In fact, people in such conditions will most likely play control games regarding whose understanding of the ceremony is correct. Of course, this is seen in other religions as well. Once people have suffered physiological damage resulting in addiction, anxiety, depression, and PTSD, such damage requires treatment just as with cancer or any other illness. There has been the hope that if Indians returned to their traditional ceremonies, their addictions would be healed. Unfortunately, clinical observations have not shown this to be so. Therefore, a broader treatment approach is indicated.

The success rates of “12 Step” and typical rehabilitation programs show that only 3% to 8% are sober after 4 years (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 1996; Mathews-Larson, 1991; Polick, Aarmor, & Bracker, 1980). Meanwhile, there is growing addiction to replacement prescription drugs such as benzodiazapines (i.e., Valium or Xanax). High rates of PTSD, depression, and suicide continue in the Indian population. Whether the origin of the alcoholism and drug abuse is genetic, the result of abuse, or both, the research indicates that, in each situation, there are brain-wave abnormalities that must be addressed for successful treatment. It became important for our organization to find treatment that is traditional, appropriate, and scientifically well researched.

Electromedicine as a Traditional and Therapeutic Response

Electromedicine has a long tradition across cultures. After Benjamin Franklin’s demonstration of electricity, John Wesley, the English clergyman and founder of the Methodist movement, used electrical treatments in clinics in England some 250 years ago. By 1753, Wesley’s interest in electricity caused him to believe that it could be used for therapy. In 1760, Wesley published *Electricity Made Plain and Useful by a Lover of Mankind and of Common Sense* (Malony, 1995). Wesley began by using electricity on himself to treat

his own lameness. Seeing electricity as inexpensive and available to everyone, Wesley found it useful for 37 conditions—including headaches, sprains, back pain, sciatica, and limb contractions. Soon after, Benjamin Franklin himself began using electrical medical treatments (Malony, 1995).

Electric medicine goes back to even earlier times. At least two millennia ago, physicians used electric eels to relieve pain. Among those who were using various species of electric eels were Egyptians, Abyssinians, Etruscans, and South American Indians as well as some African tribes. Many classical writers such as Plato, Aristotle, and Cicero refer to electromedicine as well. This treatment was used for headache, gout, rheumatism, and various serious mental illnesses. African tribes made therapeutic use of electric fish to cure sick children by putting the fish into a bowl of water, leaving the child to play with it. American Indians used the species *gymnotus* and similar uses were made in Dutch Guiana (Wilson, 1858).

The use of electrical treatment is taken for granted in a variety of areas—cardiac defibrillators, transcutaneous electric nerve stimulators (TENS Units), and bone stimulators. Especially important to American Indians and others, FDA-accepted units are now increasingly used by tribes to prevent amputation of legs because of diabetic neuropathy. Counselors at our outpatient facility have found that FDA-accepted cranial electrical stimulation (CES) works well for anxiety (Overcash & Siebenthal, 1989), depression (Marshall & Izard, 1974; Passini, Watson, & Herder, 1976), and PTSD as well as cognitive damage from substance abuse (Smith & O'Neill, 1975). CES has been researched in double- and triple-blind studies for several decades; because it does not have to cross the blood-brain barrier, it has no serious or lasting side effects. Electromedicine stimulates neurotransmitters and normalizes brain waves (Heffernan, 1997), including the P300 craving wave (Braverman, Smith, Blum, & Smayda, 1990). By the 1980s, 80% of clients using CES treatment were still sober (non-using) after 7 years. It has been researched and found effective in a variety of addictions including alcohol, cocaine, benzodiazapines, heroin, marijuana, methadone, and nicotine (Patterson, 1986). It is an inexpensive, self-administered micro-current delivered by a 9-volt battery. It responds well to the science underlying conditions described above.

Indian Education in a Public School Setting

In addition to the activities of our outpatient mental health and addiction facility, we began working directly with an Indian Education Program this past year in a nearby school district (funded by the federal law called Johnson-O'Malley; see http://www.federalgrantswire.com/indian_educationassistance_to_schools.html). The school system has approximately 25% Indian enrollment. In the past year, we have met with elementary, middle school, junior high,

and high school students. We received approval by the Indian Education Parents' Group and the local school board of education. We often met with parents as well.

We have administered Myers-Briggs testing to many of the students and given them feedback related to their learning styles, strengths and weaknesses, and strategies for success in school and interpersonal relationships. Most of these students lack family and school encouragement to continue education to the college level even when they are capable students. We collaborated actively with the Indian Education Office in encouraging students to take ACT and SAT tests and to be knowledgeable regarding their grade point averages. We also advised students on college application essays. We have helped them find campuses that would be best for them given their preferences and abilities. The Indian Education Office actively assists them in completing financial aid forms.

The students we saw most often were children of divorced parents, with one or both parents addicted to alcohol and drugs. Students may live with other family members who are addicted. Many students have been moved from school system to school system and from parent to parent. Some have no homes and do not know where their parents are. They often move from one friend's house to another. Many abuse alcohol and drugs and may already be addicted. Most are obese in spite of active participation in competitive school sports. As professionals, we must address the addictions to food, and especially to carbohydrates, as part of the addiction picture.

We counseled students for a variety of issues from relationships to more serious problems such as substance abuse, depression, anxiety, and PTSD. To address the mental aspect, we have provided them with elder and experiential learning related to culture and history and referred them to nearby tribal-language classes (see Figure 4). We have provided them with CES for focused learning and test taking. Students often come to the Indian Education office without encouragement to "check out" a CES unit that will help them relax and focus.

For the emotional aspect, we provided them with CES and nutrition information for anxiety, depression, PTSD, grief, anger, and irritability and used culturally competent counseling and art therapy.

In terms of the physical aspect, we taught them about the diet that was traditional for their specific tribes before European conquest. This can vary greatly depending on the geographical area where the tribes lived historically (e.g., seafood, fresh-water fish, buffalo, etc.). We encouraged exercises that they can and will do. The Indian Education Office provided a water cooler with L-Glutamine in the water for food, alcohol, and nicotine cravings. It has no taste and is readily used this way. Available over the counter, it is often used in sports and for other reasons. We received reports that some students never seen for counseling used the L-Glutamine water and automatically found themselves smoking less.

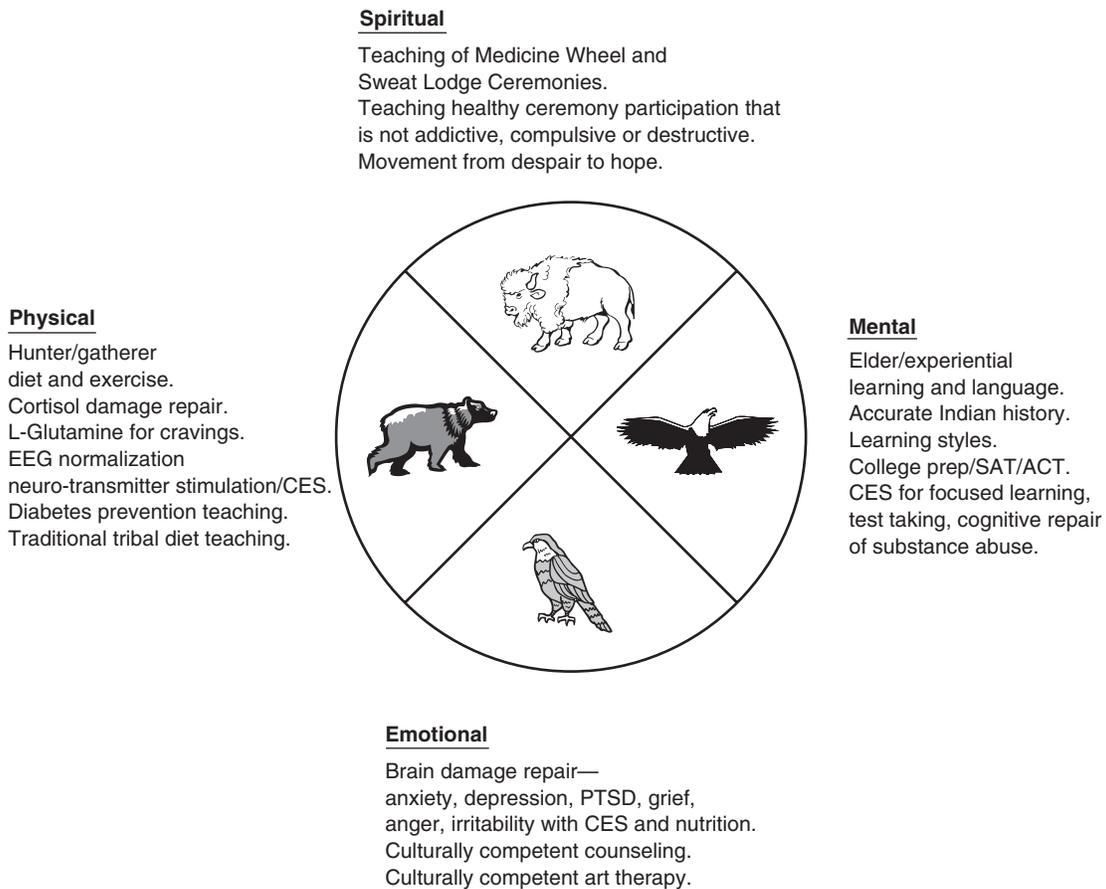


FIGURE 4. Medicine Wheel Changes Needed in Public School Setting.

We have also provided them with CES units to assist EEG normalization and neurotransmitter stimulation.

As far as the spiritual aspect, students participated in medicine wheel education and a medicine wheel ceremony at the beginning of the year. We encouraged healthy ceremony participation that takes into consideration individual belief systems, the varied tribal symbols and customs, and practices that are not addictive, compulsive, or destructive.

SUMMARY

Because Indians experience the highest levels of accidents, suicide, homicide, violent crime, domestic violence, alcohol and nicotine abuse, type 2 diabetes, depression, PTSD, unemployment, poverty, and school dropout for any racial group in the United States, it is critical that such clients receive the most effective prevention and treatment.

Whether in schools (where prevention and early intervention are badly needed), inpatient, or outpatient settings, the medicine wheel can be used as a guide for activities, interventions, and needed research. Indians suffer not only

from inadequately funded health care but also, more important, they suffer from treatment that is too often ineffective—and not based in culture or good science. We can individualize the use of the medicine wheel to the needs of each client while taking into consideration the variety of histories and cultures of the many tribes. We must use the most up-to-date scientific research in combination with traditional cultural activities for balance, healing, and growth in all directions—mental, emotional, physical, and spiritual. New science affirms the wisdom of the medicine wheel—that individually, and collectively, we are all related.

REFERENCES

- Anderson, C. M. (2001). The integrative role of the cerebellar vermis in cognition and emotion. *Consciousness & Emotion*, 2(2), 284-299.
- Anderson, C. M., Polcari, A. M., McGreenery, C. E., Maas, L. C., Renshaw, P. F., & Teicher, M. H. (1999). Cerebellar vermis blood flow: Associations with psychiatric symptoms in child abuse and ADHD. *Society for Neuroscience Abstracts*, 25(Part 2), 1637.
- Bauer, L. (2001, July). EEG shown to reliably predict drug and alcohol relapse potential. *Neuropsychopharmacology*.

- Begleiter, H., & Porjesz, B. (1988). Potential biological markers in individuals at high risk for developing alcoholism. *Alcoholism: Clinical and Experimental Research*, 12(4), 488-493.
- Bell, L., & Martin, K. (2002). A natural prescription for addiction. *Counselor*, 3(4), 40-44.
- Braverman, E., Smith, R., Blum, K., & Smayda, R. (1990). Modification of P300 amplitude and other electrophysiological parameters of drug abuse by cranial electrical stimulation. *Current Therapeutic Research*, 48(4), 586-596.
- Bremner, J., Narayan, M., Anderson, E., Staib, L., Miller, H., & Charney, D. (2000). Hippocampal volume reduction in major depression. *American Journal of Psychiatry*, 157, 115-127.
- Bremner, J., Randall, P., Vermetten, E., Staib, L., & Bronen, R. (1997). Magnetic resonance imaging-based measurement of hippocampal volume in posttraumatic stress disorder related to childhood physical and sexual abuse—a preliminary report. *Biological Psychiatry*, 41, 23-27.
- Brookhaven National Laboratory. (2004). *Exposure to food increases brain metabolism*. Retrieved from <http://www.bnl.gov/bnlweb/pubaf/pr/2004/bnlpr041904.htm>
- Campbell, G. R. (1994). The politics of counting: Critical reflections on the depopulation question of native North America. In C. M. Gentry & D. A. Grinde, Jr. (Eds.), *The unheard voices: American Indian responses to the Columbian quincentenary 1492-1992* (pp. 66-108). Ann Arbor, MI: Edwards Brothers.
- Dapice, A. (1997, June). *The international decade of indigenous peoples*. Paper presented at the Sovereignty Symposium, Tulsa, OK.
- Dapice, A., Inkanish, C., Martin, B., & Brauchi, P. (2002, September). Killing us slowly: When we can't fight and we can't run. *Native American Times*. Retrieved from http://www.dlncoalition.org/related_issues/killing_us_slowly.htm
- Dapice, A., Inkanish, C., Martin, B., & Montalvo, E. (2001, June). Killing us slowly: The relationship between type two diabetes and alcoholism. *Native American Times*. Retrieved from <http://vltakaliseji.tripod.com/Vltakaliseji/did20.html>
- Duffy, J. (1951). Smallpox and the Indians in the American colonies. *Bulletin of the History of Medicine*, 25, 324-341.
- Duran, E., & Duran, B. (1995). *Native American postcolonial psychology*. Albany: State University of New York Press.
- Golier, J., & Yehuda, R. (1998). Neuroendocrine activity and memory-related impairments in posttraumatic stress disorder. *Development and Psychopathology*, 10, 857-869.
- Heffernan, M. (1997). The effect of variable microcurrents on EEG spectrum and pain control. *Canadian Journal of Clinical Medicine*, 4(10), 2-8.
- MacKeen, D. (2000). *Hormonal rages: A new study links decreased levels of cortisol with aggressive behavior in boys*. Retrieved from <http://www.salon.com/health/log/2000/01/14/cortisol>.
- Malony, H. N. (1995). John Wesley and the eighteenth century therapeutic uses of electricity. *Perspectives on Science and Christian Faith*, 45, 244.
- Mandell, A. (2005). *Nearness of grace: A personal science of spiritual transformation*. Retrieved from www.cieloinstitute.org/pages/357835/page357835.html?refresh=1111958880143
- Marshall, A. G., & Izard, C. E. (1974). Cerebral electrotherapeutic treatment of depressions. *Journal of Consulting and Clinical Psychology*, 42(1), 93-97.
- Mathews-Larson, J. (1991). *Seven weeks to sobriety*. New York: Villard Books.
- Myers, I. B., & Briggs, P. B. (1980). *Gifts differing*. Palo Alto, CA: Consulting Psychologists Press.
- National Institute of Drug Abuse. (2002, April 8). *NIDA addiction research news*. Retrieved from <http://www.drugabuse.gov/MedAdv/02/NS-04.html>
- National Institute on Alcohol Abuse and Alcoholism. (1996). *NIAAA reports Project MATCH main findings*. Retrieved from <http://www.niaaa.nih.gov/NewsEvents/NewsReleases/match.htm>
- Overcash, S. J., & Siebenthal, A. (1989). The effects of cranial electrotherapy stimulation and multisensory cognitive therapy on the personality and anxiety levels of substance abuse patients. *American Journal of Electromedicine*, 6(2), 105-111.
- Passini, F. G., Watson, C. G., & Herder, J. (1976). The effects of cerebral electric therapy (electrosleep) on anxiety, depression, and hostility in psychiatric patients. *Journal of Nervous and Mental Disease*, 163(4), 263-266.
- Patterson, M. A. (1986). *Hooked? Net: The new approach to drug cure*. London: Faber & Faber.
- Polick, V., Aarmor, D., & Bracker, H. (1980). *The course of alcoholism, Four years after treatment*. Santa Monica, CA: RAND.
- Propping, P., Kruger, J., & Mark, N. (1981). Genetic disposition to alcoholism. An EEG study in alcoholics and their relatives. *Human Genetics*, 59, 51-59.
- Rausch, D., & Schlepp, B. (1994). *Native American voices*. Grand Rapids, MI: Baker Books.
- Robert Wood Johnson Foundation. (2001). *Substance abuse: The nation's number one health problem*. Retrieved from www.rwjf.org/files/publications/other/SubstanceAbuseChartbook.pdf
- Sapolsky, R. (2000). Glucocorticoids and hippocampal atrophy in neuropsychiatric disorders. *Archives of General Psychiatry*, 57, 925-935.
- Shalala, D., Trujillo, M., Hartz, G., & Paisano, E. (2001). *Trends in Indian health*. Retrieved from www.his.gov/Publications/trends98/front.pdf
- Smith, R. B., & O'Neill, L. (1975). Electrosleep in the management of alcoholism. *Biological Psychiatry*, 10(6), 675-680.
- Stannard, D. E. (1992). *American holocaust: Columbus and the conquest of the new world*. New York: Oxford University Press.
- Steckel, R. H., & Rose, J. C. (2002). *The backbone of history: Health and nutrition in the Western hemisphere*. New York: Cambridge University Press.
- Stiffarm, L. (with Lane, P.). (1992). The demography of native North America. In M. Annette Daines (Ed.), *The state of native America: Genocide, colonization, and resistance* (pp. 23-54). Boston: South End.
- Stone, J. (2005, June 15). *Indian youth suicide*. Testimony of the American Psychological Association before the Senate Committee on Indian Affairs, Washington, DC. Retrieved from <http://www.apa.org/ppo/ethnic/stonetest.html>
- Tabakoff, B., & Hoffman, P. L. (1988). Genetics and biological markers of risk for alcoholism. *Public Health Reports*, 103(6), 690-698.
- Tanner, L. (2004). *Study: We're eating ourselves to death*. Associated Press. Retrieved from www.cbsnews.com/stories/2004/03/09/health/main604956.shtml
- Teicher, M. H. (2002, March). Scars that won't heal: The neurobiology of child abuse. *Scientific American*, 68-75.
- Thornton, R. (1987). *American Indian holocaust and survival*. Norman: University of Oklahoma Press.
- Tinker, G. E. (1996). An American Indian theological response to ecojustice. In J. Weaver (Ed.), *Defending Mother Earth: Native American perspectives on environmental justice* (pp. 153-176). Maryknoll, NY: Orbis Books.
- Volavka, J., Pollock, V., Gabrielli, W. F., & Mednick, S. A. (1985). The EEG in persons at risk for alcoholism. *Recent Developments in Alcoholism*, 3, 21-36.
- Weslager, C. A. (1996). *The Delaware Indians*. New Brunswick, NJ: Rutgers University Press.
- Wilson, G. (1858, January). On electric fishes as the earliest electric machine employed by mankind. *The Canadian Journal*, 13, 58.
- Yehuda, R., Kahana, B., Binder-Brynes, K., Southwick, S., Mason, J., & Giller, E. (1995). Low urinary cortisol excretion in Holocaust survivors with posttraumatic stress disorder. *American Journal of Psychiatry*, 152, 982-990.