

Salish culture, foods and medicines: indigenous traditions and CAM for the prevention and treatment of diabetes type 2.

Print

Author: Korn, Leslie; Ryser, Rudolph C.

Geographic Code: 1USA

Date: May 1, 2009

Words: 8529

Publication: Townsend Letter

ISSN: 1940-5464

Introduction

Diseases previously unknown to the population of native peoples of the north Pacific Coast of the US and Canada were introduced by colonizing peoples and ravaged the Salish peoples for more than 225 years. Similarly, market economic policies contributed to the steadily growing incidence of chronic disease beginning in the early 20th century. Acute diseases producing rapid death struck longhouse peoples in the 18th and 19th centuries, and in the 20th and 21st centuries these populations experienced a growing epidemic of chronic diseases introduced through processed foods, new modes of transportation, and major environmental changes.

[ILLUSTRATION OMITTED]

Smallpox was first brought to the north Pacific Coast in 1775, beginning a 100-year era of death among longhouse peoples. Another wave of disease struck longhouses when outsiders arrived in 1805 with measles, chicken pox, and influenza. In about 1830, a mosquito passenger on a ship anchored at the mouth of the Columbia River brought malaria into the rainforest and mated with the local mosquitoes there. This apparently unremarkable event produced a cascading catastrophe that expanded the 100-year terror of disease among the peoples living along the lower Columbia River, up the Cowlitz River, and eventually into the region of the Frazier River and farther north. (1) Whole longhouses (extended family homes with 25 to 400 residents) suffered enormous losses of life from malaria. Having no immunity, people died from the disease within days. Healers were confounded. Fearing that the medicine people were using destructive tomanowus, or spirit power, survivors killed many of them. Of those living in close-quarter longhouses, 50% to 90% died. The survivors ran away ... to other longhouses. Smallpox and malaria spread, returning every summer and fall for years.

As more outsiders arrived, more diseases and waves of disease struck surviving populations. In 1841, the Catholic church arrived in the south and lower Cowlitz River area of Washington and Oregon. The arrival of priests also brought antibiotics. When Indian people were inoculated against various diseases, they survived. The church's medicine was considered quite strong, and therefore eventually led to the subordination of traditional medicine practices. There were clearly more incidents of introduced disease, and the outside medicine proved essential. People's confidence in native medicine was seriously shaken by generations of disease. The church made it clear that the Indian could no longer access spirit powers without its help. By the 1840s, its schools continued to emphasize the importance of following the church and rejection of traditional practices. Clearly, all evidence available pointed to following the practices of the "black coats."

As more outsiders moved into Indian territories, new foods and practices were introduced to replace old

ways. Indeed, where so many people of medicine, leaders, artists, philosophers, and craftspeople had been killed by disease, many of the survivors were left to fend for themselves. The outsiders provided an apparent safe harbor. The people would be weaned from their well-established but now sundered way of life. Cultural practices would undergo profound transformation. The strategy was to wean people away from reliance on the land. Then they would not need access to deer, fish, and other traditional foods. They could become "civilized."

Over time, the outsiders' apparent generosity turned against descendants of the longhouse Indians. The introduction of pig fat, wheat and rye flour, milk, and sugar became the nutritional basis for what was to become a rapidly growing epidemic--diabetes, heart disease, substance abuse, violence, cancer, attention deficit/hyperactivity disorder (ADHD), and depression.

In the 21st century, the descendants of the surviving longhouse Indians are now faced with the need to retrieve their ancestral knowledge to treat and reverse the scourge of slow death from chronic disease. They are gathering together once again, to remember the wisdom of the elders; to tell stories; to find the old, hidden places where the camas still grows; and to prepare and share their foods with others. The Salish people are joining indigenous peoples all over who are restoring their traditions.

Diabetes and American Indians

Diabetes develops from the disruption of traditional and natural ways of living. The disease is made worse by the historical and contemporary traumas that individuals and communities experience. As recently as the 1940s, diabetes was uncommon, and in some indigenous communities now suffering from growing incidence of diabetes, the period has only been 10 or 15 years. Tribal communities that still have access to traditional foods and practice methods of traditional preparation rarely see diabetes.

Preparing foods for diets based on gathered traditional foods (or appropriate substitutes) and applying principles of traditional nutrition are two essential components of a strategy to prevent diabetes and maintain good health. The culture of one's native cuisine, in other words, constitutes insurance against chronic disease. The social activities of gathering, preparing, and sharing foods reestablish the values of community and generosity as well as purposeful physical exercise to counteract sedentary behaviors.

Culture is the root of community and individual health. Foods from the environment in which we live provide the physical, emotional, mental, and spiritual nourishment required for balance, health, and productivity. Restoration of balance in one's spirit and relationships with community members is also required. Restoring one's personal confidence and commitment to generosity within a community is also essential. Where there is imbalance, there are wounds in the spirit that ultimately manifest as a chronic disease condition like diabetes.

Research on the genetic contributions to diabetes shifts the focus away from the environmental and social issues, which are the core cause of this disease. A holistic analysis also changes the focus from a defect of the individual to an integrative perspective that acknowledges the role of culture, historical events, traumatic experiences, language, stories, traditional medicines, politics, and socioeconomic patterns of whole-community change. All these factors in cooperation with orthodox diagnostics provide information for the whole-systems design of individual and community health programs.

[ILLUSTRATION OMITTED]

Historical Trauma

Historical trauma disrupts the psychobiological rhythms of the individual and the community, and results in adrenal stress and the inability to metabolize glucose. The term historical trauma refers to the collective emotional and psychological injury both over one's life span and across generations, resulting from a cataclysmic history of genocide. Dr. Eduardo Duran uses the term soul wound as a way of

understanding the spiritual depth of historical trauma. (2) The historical experience of cultural groups exposed to prolonged stress and suffering resulting from war, genocide, and interpersonal violence triggers the "transfer" of physiological, biological, and emotional stress to successive generations. This "trauma transfer" is referred to as intergenerational trauma. This vulnerability to stress is encoded in the body and sets the stage for disruption of metabolic function.

Nutrition Trauma

The challenge of eating well is a community issue, not just an individual or family problem. Nutrition trauma is a subset of community trauma. (3) It involves the disruption of access to indigenous natural foods and medicines as a result of imposed and overwhelming external forces. Development; introduction of agriculture; deforestation; environmental destruction; contamination by toxic wastes, pesticides, and herbicides; and the imposition of land tenure laws that displace populations make inaccessible to native peoples a wide range of foodstuffs that are suited to healthy digestion and nutrient utilization.

[ILLUSTRATION OMITTED]

Nutrition trauma occurs when introduced foods replace the use of native foods. The capacity of indigenous peoples to digest and metabolize these new foods is often limited or impossible. Introduced foods may cause disease and debilitation--conditions that were unknown or rare before colonialism. Nutrition trauma is the major cause of the rapidly increasing incidence of diabetes, heart disease, obesity, ADHD, and allergies in native communities. American Indians on reservations in the mainland US and Canada; aboriginal peoples in Australia; Maoris in New Zealand; Indians in Mexico; and native peoples in Alaska, Hawaii, Colombia, and the Philippines are experiencing epidemic diabetes and related diseases in response to nutrition trauma.

Salish Peoples and Their Foods

The Salish peoples include the Siletz and Wasco in Oregon; the Taidnapum Cowlitz, Quinault, S'Klallam, and Skagit of Washington; the Wenatchee and Kootenai of Montana and Idaho; and the Stl'atl'imx, Gitskan, Okanagan, and Nuxalk of British Columbia. For many thousands of years, these nations and their ancestor nations have depended on a great variety of foods and medicines to support a healthy life.

All foods in the Salish territory are naturally whole foods. They are powerful medicine. The Salish cornucopia includes a great abundance of roots, greens, berries, nuts, apples, seeds, flowers, honey, tree sap, tree bark, deer, elk, bear, pheasant, ducks, geese, and seafoods, including seaweed, shellfish, salmon, cod, halibut, and the oolichan, also known as smelt.

All peoples of the Salish region shared in the great abundance from the land, air, and sea through an extensive system of trade, using the waterways and paths that have in some places been made into modern highways. Indeed, these major routes are called the Oolichan Grease Trails (the name Oregon is derived from the term oolichan, so important is this food) because, as families travelled from the Pacific Coast eastward to trade the precious oolichan oil for the roots and medicines of the mountains, drops of the oil fell along the way. In the 200 years since contact, the natural variety and extent of abundant foods and medicines rapidly declined, and in some instances collapsed altogether. Only in recent decades have some of these foods been restored as a result of Salish peoples' protecting and reestablishing some plants, fish, and animals in the wild.

Oolichan Oil

Oolichan (smelt, *Thaleichthys pacificus*) oil is one of the most important foods of the Salish people. Along with the salmon, the seal, and the whale, the oolichan is a source of rich oil used to flavor bland

vegetables and meats or enhance the flavor of fruits and berries. This important oil is available only from the silvery oolichan that come up coastal rivers in Salish territory and nowhere else in the world. The abundance of salmon and oolichan provided ample fats that nourished the brains and arteries of Salish ancestors. Today, many health problems derive from the diminution of these important resources. (4)

Skilled Salish people produce oolichan grease as a result of exacting processing techniques, using one of the many varieties of oolichan that spawn in Pacific coastal rivers and then swarm into the ocean. Like salmon, the oolichan live nearly all of their lives in the ocean and return to their native river to spawn the next generation.

Oolichan oil is not only a favored condiment for dipping foods and binding dried fish or berry cakes, it is also a powerful salve for burns, insect bites, abrasions, and chronic skin conditions. Traditional uses include adding oolichan grease as a preservative, binder, and flavoring to dried berries like salal or chokecherries to form large cakes for food in winter--a time when no berries are available. Oolichan oil has a relatively high docosahexaenoic acid (DHA) content, ranging from from 0.5% (5) to 24%. (4) Kuhnlein's research suggests that the DHA content increases by 100% to 1500% after ripening and rendering, though this level is contested by Phinney et al. (5) We speculate that the location of rivers from which the fish are collected, the season, and/or the processing methods may account for these divergent findings. More research in this area is needed.

Daily consumption of 2 to 4 ounces of oolichan makes it an important food to support brain, blood, heart, and adrenal function. (5) DHA repairs and builds material for membranes surrounding the brain nerve synapses and is an important substance for replacing the sticky surface of blood cells with a slippery coating, thus reducing the tendency of blood cells to clog the arterial system. The precious oolichan oil and other marine sources of DHA and EPA are now used to treat diabetes, heart disease, depression, posttraumatic stress disorder, additions, autoimmune diseases, learning disorders, and chronic pain.

Salish Food Mounds

The conventional nutrition model adheres to the US Department of Agriculture food pyramid, which includes standardized servings of various food groups defined by the American Diabetes Association. (6) The food pyramid and its permutations are less a response to human nutritional needs than to the commercial demands of wheat, beef, and milk producers. Indigenous peoples' health demands an alternative model. Even the small adjustments designed to address native diets found in the USDA food pyramid are inadequate. Conventional biomedical models of treatment and prevention commonly impose a model of nutrition and health that fails to benefit native peoples, since these models do not plan for cultural specificity.

Indigenous science, the time-tested methods that link environment, foods medicine, and culture, point to appropriate food use today based on historical food-use patterns of peoples indigenous to the Pacific Northwest. In the Pacific Northwest and throughout much of the northern climes, indigenous peoples have maintained health by using foods rich in essential fatty acids (EFAs). However, modern diets are usually deficient in EFAs. This deficiency, resulting from both the loss of authentic food and the introduction of hydrogenated fats along with sugar and refined flour, contributes significantly to the development of type 2 diabetes.

Recent studies have demonstrated the positive effects of low-carbohydrate diets for Pacific Northwest natives with diabetes. These diets provide mainly protein and fats. Phinney et al. conducted a demonstration project that provided a traditional-style diet (low carbohydrate, high fat, and protein) with a First Nations community and found significant reduction of weight, and significant improvement of symptoms of metabolic syndrome and diabetes. (5) This community-based study was also a feasibility project in which community members and medical staff collaborated. Similar diets that emphasize

protein and fats, such as the Atkins diet, have also been shown to be more effective for weight loss and comparable or better in lowering triglycerides, blood pressure, cholesterol, and glucose. (7)

Lipid abnormalities are common in individuals with type 2 diabetes, and a number of randomized controlled trials have found that fish-oil supplementation significantly lowers serum triglyceride levels in diabetic individuals. (8) These fats also reduce inflammation, which results from diets high in trans-fats, and decrease neuropathic pain. (9), (10) It is clear from an examination of traditional diets of the Pacific Northwest peoples that there was an abundance of fat and proteins and limited carbohydrate consumption in the form of roots, barks, and berries. Based on our calculations, each individual used an average of 10 gallons a year of oolichan grease.

Native Knowledge Explains Biomedical Science

There is an important relationship among diabetes, natives, and the delta 6 desaturase enzyme (D6D) used to metabolize fats. Many native peoples maintain their health with the use of fats from fish, bear, seal, and whale. EFAs, derived from saturated fats, fish, fish oils, nuts and seeds, and plants such as evening primrose, have been part of the culinary and medicinal pharmacopeia for centuries.

D6D is an enzyme of particular importance to the metabolism of fats. Pacific Northwest natives, and others who have been predominantly culturally/genetically users of more direct sources of DHA and EPA derived from seal, whale, or oolichan over many generations, often lack this enzyme. The Irish, Scots, and Ainu in northern Japan also have a deficiency in this enzyme. D6D is required for the conversion of EFAs to the anti-inflammatory prostaglandins. Because carnivorous and coastal peoples had more than sufficient exposure to these converted long-chain fats, they developed mutations wherein the enzyme was no longer required for their metabolism. (11)

When action of this enzyme is blocked, so is the entire pathway of conversion of EFAs to their anti-inflammatory state. Deficiencies of biotin, vitamin E, protein, zinc, B12, and B6 also interfere with the action of D6D and other enzymes involved in prostaglandin production. These vitamins are often deficient in diabetes and are an essential part of treatment.

One of the most important dietary practices for a native individual while eating sources of EFAs is to ensure sufficient intake of saturated fats, which aid in assimilation of EFAs. (11)

Nutritional and Herbal Supplementation for Diabetes

Nutrient dense, culture-congruent whole foods must be augmented with an intensive regimen of vitamin/mineral/glandular supplementation, supported with medicinal and culinary herbs and spices to restore health. We recommend using a combination of foods, nutritional supplements, and plant medicines to achieve your health goals.

We address these goals in diabetes:

- * Reduce, stabilize, and control blood glucose levels throughout the day.
- * Reduce arterial and venous inflammation.
- * Improve arterial strength.
- * Improve circulation to extremities.
- * Improve kidney function and lymphatic flow
- * Reduce pain.

- * Reduce and manage stress and stabilize stress hormones.
- * Improve vision.
- * Increase energy to support increased physical activity.
- * Improve mood and enhance selfcare capacity.

Each individual is assessed according to biochemical individuality. A comprehensive plan is developed that includes diet, nutritional supplementation, detoxification, bodywork, energy medicine exercises, and community support. Below is a sample protocol and some of their proposed benefits:

Notes on the Protocol

Adrenal Organic Glandular. This supplement, derived from bovine adrenal tissue, supports metabolism and physiological function of adrenal glands. It addresses fatigue, sugar metabolism, and weight loss. Adrenal Organic Glandular supports both the medulla and cortex of the gland. The adrenal cortex is the outer portion of the adrenal gland and is involved in the secretion of a variety of adrenal hormones, mainly cortisol. The medulla, the inner portion, is involved in the synthesis and secretion of epinephrine (adrenaline) and norepinephrine.

Comprehensive Vitamin/Mineral for Glucose Management. A broad-spectrum vitamin/mineral compound that also provides trace nutrients for the hypoglycemia and hyperglycemia is central to any prevention of treatment protocol. Where budgets preclude extensive access to nutrients, these are the ones we use. In the clinical setting we use either BioGlycozyme or Glucobalance, produced by Biotics Research Inc.

Cinnamon (tea or extract). Cinnamon is a warming and stimulating tonic that supports normal circulation. Boiling the bark in the morning makes a delicious tea and supports healthy digestion, improves appetite, and relieves gas and digestive discomfort.

Glucose Tolerance Factor (GTF) (chromium). This supplement provides a formulation of nutrients that support the body in regulating blood sugar within normal levels. Chromium, an essential mineral, and guar gum, a soluble fiber, are known to play important roles in blood sugar regulation within normal levels. GTF has been shown to potentiate the action of insulin at the cellular level. Guar gum slows glucose uptake. Niacin is essential for the synthesis of GTF. There are many excellent GTF formulations. We use Allergy Research formula with success in our Nutrients for Natives Program.

Corosolic Acid is derived from the herb *Lagerstroemia speciosa* L. It helps regulate blood sugar and supports carbohydrate metabolism.

Pancreas Glandular provides enzymes that enhance and support digestion, modulate immune function, and support balancing of blood glucose. This glandular supports pancreatic function and fat digestion. Pancreas glandular contains significant levels of amylase, protease, and lipase, as well as other digestive factors naturally occurring in the pancreas.

Fish Oil. Hundreds of research studies around the world verify that omega-3 fish oils offer extraordinary health benefits--reducing inflammation and increasing blood flow throughout the brain and body. The DHA in fish oil increases insulin sensitivity.

Psyllium Husk. Psyllium seed husk has been shown to reduce hunger, reduce cholesterol, slow glucose uptake, improve bowel function, and relieve constipation.

Resveratrol and Heart Health Nutrients (VasculoSirt). We recommend a comprehensive cardiovascular support formula that contains resveratrol; alpha-lipoic acid (ALA); CoQ10; and other heart, artery, and longevity supporting nutrients. Epidemiological studies demonstrate that resveratrol may significantly reduce the risk of cardiovascular disease because of anti-inflammatory mechanisms of the compound and resveratrol inhibits platelet aggregation and cyclooxygenase. (13) Subjects with progressive loss of vision may benefit from resveratrol supplementation. Resveratrol shows protective mechanisms in animal models with retinopathy by blocking the intracellular calcium. (14) Resveratrol stimulates SIRT-1 and SIRT-3 activity, and it has been shown in animal research models to prolong life and mimic the effects of calorie restriction. Other ingredients in this formula include ALA, which is approved in Germany as a medical treatment for peripheral neuropathy, a common complication of diabetes. ALA speeds the removal of glucose from the bloodstream, at least partly by enhancing insulin function. It reduces insulin resistance and increases ATP production.

Rhodiola is an adaptogen; it helps the body adapt to stress by supporting adrenal function. It increases energy and improves mood, mental clarity, and memory. It is used to decrease fatigue and stress and to enhance physical performance.

Pyridoxamine is a potent form of Vitamin B-6. It appears to block glycation, a process wherein sugars react with body proteins to produce glycation-end products (AGE) and advanced lipoxidation end products (ALE). These end products are exacerbated by diabetes, and contribute to the damage associated with kidney failure, sight deterioration, neuropathy, and atherosclerosis. (15), (16)

Vitamins E and C. Evidence suggests that taking vitamins E and C after a high-fat meal reduces postmeal oxidative stress that causes memory loss in people with diabetes. (17)

Special Protocol Additions or Substitutions

The following additions or substitutions may be indicated in the protocol:

Medicinal Beverages

Blueberry Leaf Tea Drinking blueberry leaf tea is an excellent way to lower glucose levels and regulate blood sugar. Blueberry leaf contains phenolic compounds, including chlorogenic and caffeic acids, which slow down glucose absorption, reduce the liver's production of glucose, and improve the metabolism of glucose in the body.

Green Tea Green tea has many health properties for people with diabetes. It has been shown to decrease blood glucose levels and improve endothelial function, which has positive benefits for improving atherosclerosis. (20) 1-2 cups a day are a good substitute for coffee. Green tea is also an antioxidant; it contains theanine, an anxiolytic.

Ginger Tea Fresh ginger tea is anti-inflammatory and a digestive stimulant. It may also be used for nausea, head colds, and indigestion.

Chamomile Tea This herb is well known for its relaxing effects and ability to improve digestion. Chamomile may prevent increases in blood sugar levels, reducing hyperglycemia and other associated diabetic issues. Chamomile may reduce the production of sorbitol, which is associated with eye and nerve cell damage in diabetic patients. Chamomile is readily available as a tea, and can also be taken

as an extract from an herbals company.

Healthy Cocoa Purchase sugar-free cocoa, add 1-3 drops of liquid stevia to 1 tablespoon of cocoa, and use fresh milk or substitute with almond or rice milk. Heat and have as a treat. Cocoa is rich in polyphenols, which protect the endothelial lining of the arteries and reduce blood pressure. Be careful not to overdo the cocoa, as it can be stimulating. It is a good alternative to coffee.

High Blood Pressure

* 1,000 mg of taurine before meals, twice a day;

* 500 to 700 mg of raw garlic concentrate, 1 to 3 times a day;

* 30 to 40 drops of Linden-Mistletoe Herbal Compound (HerbPharm) three times a day. This extract includes hawthorn, olive leaf, linden flower, bean pod, and mistletoe.

Diabetic Neuropathy

Patients with diabetic neuropathy require additional vitamins B6, B12, and D. (18) Vitamin D may be supplemented, by up to 10,000 units a day for 15 days, after which reduce to 5,000 IU. We recommend Bio-D-Mulsion Forte (Biotics).

Adjunctive: Use a cranial electrical stimulation (CES) machine (described further in the last section of this article) 30 to 60 minutes twice a day.

Depression

Supplement with 5-HTP (25 to 100 mg in the morning and again in the evening, 30 minutes before a meal). Begin with 25 mg and gradually increase. Occasionally, nausea will occur for the first few days but will dissipate within a few days of each dosage increase.

Adjunctive: Use a CES machine 30 to 60 minutes twice a day.

Vision

Add 1 bilberry capsule, 3 times a day.

Sleep or Anxiety Reduction

Take 1 to 2 De-Stress (Biotics) capsules, 2 to 3 times during the day. Take 2 to 3 before sleep. De-Stress is a powerful, natural anxiolytic derived from casein. A prescription-only supplement in Europe, it leaves no "hangover" or grogginess.

Inflammation and Musculoskeletal Pain: Topical Magnesium Lotion

Dr. Norman Shealy, a neurosurgeon who pioneered holistic pain medicine incorporating devices such as the TENS (transcutaneous electric nerve stimulation) units and CES, recommends the use of topical magnesium lotion (2 tsp. 2x day applied to the legs). (19) The lotion increases intracellular levels of magnesium and the "energy" hormone DHEA. Both DHEA and magnesium are generally low in people with diabetes.

Salish Plant Medicines

In Salish country, plant medicine is and was a form of tomanowus. Tomanowus can be helpful or destructive, but either way it is a power that must be summoned through ritual; that is, ceremony. Illness is understood to be a profound imbalance in the material world brought on by malevolent forces in the spirit world. Summoning the helpful powers in animals and plants can be applied to illness to restore the balance.

Plant medicine is one form of helpful or destructive spirit power that an experienced and knowledgeable person of medicine can help reverse. Stinging nettles provide a powerful treatment for arthritis when the freshly harvested canes are brushed over the painful area. The same plant makes a fine tea that "cleans the blood" and helps the liver release its toxins. Oregon grape, a low-growing evergreen that produces a deep-blue berry, is a good source for taming upset stomachs. Numerous other plants have powers to stop diarrhea or help soften the stools. Salal berries, huckleberries, and cranberries slow sugar absorption and consequently help people to prevent or slow the adverse effects of diabetes. They are also rich in blue pigment that scavenges the "rust" that collects in the bloodstream. Leaves, berries, bark, roots, stems, and flowers are all power parts of plants that act as helpful energizers, digestive stabilizers, or aids for sight, and serve as skin cleansers, hair washers, fungus managers, and pulmonary-congestion reducers. With such immense capacities to help, it is no wonder that plant medicine is so important.

When wild plants are not available, there are options such as purchasing extracts or dried plants. The process of identifying, cataloguing, and preparing plants for medicinal use is an important part of cultural and medical revitalization within communities.

Below are listed a few of the many hundreds of medicinal and culinary plants native to the Pacific Northwest.

Common Name: Alaskan Blueberry

Scientific Name: *Vaccinium alaskaense*

Sahaptin: Ililmuk (blueberry)

Description: A small-to-medium-sized shrub with yellowish-green branches and alternate leaves with small hairs. This plant blossoms with bronze-to-pinkish flowers. The fruit is a dark-blue-to-purplish black berry. It grows in the Cascade Mountains and coastal mountains from Oregon to Alaska. Blueberries are eaten fresh, dried, and cooked into sauces, jellies, and jams. They are a good source of fiber, as well as vitamins A and C. Historical uses of blueberry include blending it with meat and fat to make pemmican, as well as eating it fresh or dried. The Inupiat people use blueberries to pickle fish and bearded seal. The berries are also used as a bluish dye, and the twigs of the plant are used in the joints of cedarwood boxes. Medicinally, blueberries are known to be helpful in treating cystitis/urethritis, diabetes, and hypoglycemia. For diabetes, an afternoon dose of one-half cup of blueberry-leaf infusion can be taken to prolong the effects of insulin (injections). To prepare this infusion, steep 1 ounce of dried blueberry leaves (or 3 ounces fresh) in 2 cups of just-boiled water for 10 minutes. Strain and drink. This may help to lower the number of necessary insulin injections throughout the day.

Recipe: Blueberry Juice

Serving Size: 2;

Preparation Time: 0:15

2 cups blueberries--wild harvested

Water as needed

Stevia to sweeten

1. Place the blueberries in a saucepan. Add enough water to cover.
2. Heat to boiling, then reduce heat to a simmer for 10-15 minutes until the berries begin to break apart.
3. Remove from the heat and mash the blueberries with a potato masher to release any remaining juices.
4. Strain the mixture and chill before serving with stevia.

Alternative sources: Wise Woman Herbals makes a wonderful blueberry syrup (sugar-free), or use bilberry capsules to conveniently receive the benefits of this plant.

Common Name: Blue Elderberry

Scientific Name: *Sambucus cerulea*

Chehalis: Ts'[alpha]k'wik wuni

Description: This plant ranges in size from a large shrub to a small tree with grayish-brown bark. The leaves are large and form in compounds of five to nine ovate leaflets. The small white flowers grow in large, dense flat-topped clusters. The berries are dark blue with a whitish waxy coating, making them powdery in appearance. This species is usually found growing in valleys and on dry slopes. Blue elderberries are edible, although the stems, leaves, and bark of this plant are toxic and should be avoided. Red elderberries are also toxic and should not be eaten. The blue berries are frequently used to make preserves and syrup, and they are rich in vitamin C. They are eaten fresh in late summer or dried for winter use. The bark and leaves are made into an extract and used to treat diarrhea, colds, sore throats, fevers, cuts, and sores. Removing the pith from the stems allows them to be used as whistles or flutes. To make a tea of elderberry, steep 1 ounce of the dried berries (or 3 ounces fresh) in 2 cups of just-boiled water for 10 minutes. Drink half a cup, three times a day. Combine it with peppermint leaves to make a relaxing tea.

Recipe: Elderberry Juice

Serving Size: 4;

Preparation Time: 0:05

1 cup elderberries--crushed

4 cups water

5 drops stevia extract, or 5 teaspoons maple sap

1. Place berries into a bowl and crush.
2. Mix with the water--sweeten with stevia or maple sap.

Alternative sources: Another way of using elderberry is in extract form. An extract of elderflower that is used to treat colds, flus, and bronchial problems is available through Herb Pharm. The standard dosage for this extract is 30 to 40 drops taken in water 2 to 5 times daily.

Common Name: Serviceberry, Saskatoon Berry, June Berry

Scientific Name: *Amelanchier alnifolia*

Klallam: cetc'i'ntc

Description: This spreading shrub ranges from 3 to 20 feet in height. It has smooth bark that is reddish

to gray, and its leaves are 1 to 2 inches long with tothing on the top half. They are oval in shape and rounded at the tip, growing alternately on the stem. The white, five-petaled flowers bloom from April to June in drooping or upright clusters. The ripe berries are red to dark blue. Serviceberry shrubs grow in well-drained soils in woods or open hillsides. The berries range from flavorful and juicy to dry and seedy, depending on the moisture and conditions of the season. They are an important food for many Pacific Northwest natives, who enjoy them fresh or dried for winter use. The Chehalis dry the berries to flavor soups and meats, and the Lummi dry them to eat in winter with dog salmon. The leaves and bark of serviceberry are used medicinally for colds and stomachaches, as well as problems with pregnancy and childbirth. The cambium, or green inner bark, is used to reduce eye inflammation. Constipation may sometimes be treated with the berries. An infusion of the dried leaves and bark can be made by steeping 1 ounce of the dried material (or 3 ounces fresh) in 2 cups of just-boiled water for 10 minutes, then straining. Drink one-half cup up to three times a day.

Common Name: Wild or Beach Strawberry

Scientific Name: *Fragaria chiloensis*

Quileute: T'obiya ("pick them up berries")

Description: This perennial grows low to the ground from 2 to 8 inches high. It has thick, toothed leaves that grow in groups of three and turn reddish during the winter months. They are dark green above with fine hairs below. The flowers are white with five petals and grow on stalks separately from the leaves. The red berries are sweet and juicy with seeds on the surface. They appear between April and June. Wild strawberries are eaten fresh, dried, or cooked in a multitude of desserts. They are high in vitamins A and C, as well as sulfur, calcium, potassium, and iron. The young shoots are also edible, as are the leaves, which can be used fresh or dried in herbal tea blends. Strawberry may be used as a tonic.

Wild Strawberry Leaf Tea

Serving Size: 4;

Preparation Time: 0:05

1 1/3 tablespoons fresh strawberry leaves--torn

1 quart boiling water

1. Place strawberry leaves in boiled water.
2. Steep for about five minutes, strain and drink.

Energy Medicine and Therapies

Indigenous peoples worldwide have tested energy medicine methods using indigenous sciences for thousands of years. Among Indians of the Pacific Northwest, traditional medicine practitioners frequently employ hands-on healing, including energy healing and a variety of massage techniques, as well as herbs, drumming and singing, sweats, and the winter dance. In our clinical experience, the integration of these methods, in particular methods of massage and energy transfer that involve gentle touch, offer immeasurable benefit, physically, mentally, emotionally, and spiritually. These methods are an essential part of prevention and treatment. They relax and thus lower blood glucose. Manual lymphatic methods reduce edema. Touch feels good and facilitates a sense of well-being, and offers a nonverbal approach to showing and sharing care. It is healing, lifts spirits, and supports self-care. These modalities may be used effectively for the prevention and treatment of diabetes, cardiovascular health, neuropathy, and depression. The methods discussed below are cost-effective and generally noninvasive and easy to use.

Cranial Electrical Stimulation

Cranial electrical stimulation (CES) is an effective, nonpharmacological intervention for chronic pain, depression, anxiety, addictions, and sleep disturbances. (19-22) It provides a simple, cost-effective

approach to managing many of the symptoms that co-occur with diabetes. CES is a noninvasive form of microcurrent stimulation that uses the application of a high-frequency, low-level, pulsed current conducted through the skin and into the cranium. While there are no studies on the application of CES to sugar addiction, Schmitt et al. found CES to be effective in controlling anxiety in recovering alcoholics and, in two other studies, also found treatment with CES to decrease recovery time of alcoholics with organic brain syndrome. (23) It is likely that CES would help with sugar cravings, and anecdotal experience supports this observation. CES can improve the effects of vascular and analgesic medications. Contraindications include pregnancy or lactation, and pacemaker or other cardiac-implanted bioelectric equipment.

Qigong

Qigong ("chee-gong") is a gentle therapy that uses movement and intention to strengthen vitality. It can involve specific moving exercises or still meditation. One study found that qigong exercises, specifically one called "walking qigong," can contribute to feelings of happiness, health, and strength; improving sleep and movement; and reducing hunger. (24)

This study also showed that the practice lowered blood glucose levels immediately for most of the participants. Over three months of practice, blood glucose levels were lowered for all participants. Walking is also able to lower blood glucose levels significantly. Qigong walking is even more beneficial because it is gentler on the body and thus better for older patients or those with heart problems: qigong walking will not raise the pulse significantly or cause rapid breathing, as walking alone may do. (25)

The H-Wave Stimulator

The H-wave stimulator (Electronic Waveform Lab Inc.) is an electrostimulation device that is approved by many insurance companies for use in diabetic neuropathy. It has been shown to reduce pain associated with chronic diabetic neuropathy and potentiate the effectiveness of pharmacotherapy. (26), (27)

Light Therapy

The intersection of historical trauma, chronic stress, nutritional trauma, and poor nutrition among many native people all contribute to the dysregulation of the hypothalamic-pituitary-adrenal axis. Light therapy is an important, easy method to help restore circadian rhythm. Widely used for the treatment of seasonal affective disorder, light therapy decreases carbohydrate cravings; improves depression, pain, and PMS; and regulates sleep. The light/dark cycle of nature regulates the circadian rhythm of the brain and therefore regulates sleep, adrenal function, and thus glucose regulation. Ideally, one should wake with the light and sleep at dark; however, this is rarely possible. In addition to full-spectrum lightbulbs, high-quality light boxes should be purchased and can be used in the mornings at home or kept at the workplace. If there is a light box in the office or lunchroom, it may be used by many people during the course of the day. This improves a sense of well-being and productivity. Some light boxes (Light for Health Inc.) include a blue spectrum light, which stimulates serotonin production and is especially beneficial for mood and pain. There are no contraindications for light box use. However, excessive use can be too stimulating, and some people with a diagnosis of bipolar disorder or with migraines should start out with 5 minutes of exposure and increase it incrementally according to comfort. During the summertime, obtaining 20 minutes of sunlight at midday is also advisable or can be done in place of the light box.

Acupuncture

Acupuncture has been shown to help blood glucose levels and mood. (28) Practitioners of Traditional Chinese Medicine (TCM) may use points directly within affected areas of the body (for neuropathy) or other points outside the area along energy pathways that are also able to help work with the qi.

Practitioners also use moxibustion to stimulate specific points. Moxibustion involves burning compressed mugwort to heat these points from above the skin. Both acupuncture and moxibustion are effective ways to treat neuropathy for people with diabetes. (29-32) Moxibustion can be applied by experienced caregivers at home. Care must be taken to avoid burning the skin, as people with neuropathy lose sensation.

Magnetic Therapy

Magnetic therapy involves the application of a magnet over different parts of the body. Magnets have been used for centuries to control pain and have been recently shown to be effective for treating painful diabetic neuropathy. A study using static multipolar foot insoles of 450 gauss for 375 patients over a four-month period found that the magnets reduced numbness, tingling, burning, and exercise-induced foot pain and that they appeared to directly affect the nerve fibers that create the pain response in the skin. (33) Another study that specifically looked at Nikken Magstep magnetic insoles on painful diabetic neuropathy found an 80% reduction in pain for the diabetic test subjects. (34)

Other studies found that pulsed electromagnetic fields with various strengths and frequencies also reduced pain and vibration sensation, and increased strength for diabetic patients, and that effects were strengthened in combination with light therapy. (35), (36) The mechanism of action may work through affecting pain perception, increasing pain sensitivity thresholds, or activating processes that resist blood clotting.³⁶

Polarity Therapy

Polarity therapy is an energy medicine modality that uses touch to balance the energy currents of the body. It was developed by Randolph Stone, DO, DC, ND, and is derived from an integration of cranial osteopathy and Ayurvedic medicine. The practitioner applies pressure on reflex or trigger points in opposing locations simultaneously (for example, forehead and stomach). Energy blockages are located by palpation, then released through different depths and qualities of touch, rocking, and energy exchange. For the treatment of diabetes and its complications, the depth of touch should be light to moderate. We developed a polarity protocol that integrated polarity therapy and lymphatic massage. Polarity therapy is beneficial as an adjunctive treatment for diabetes. In the clinical setting, polarity therapy has been demonstrated to increase circulation, improve digestion and elimination, and facilitate deep relaxation, which leads to lower blood glucose levels. Scientific studies have demonstrated a reduction in depression, pain, anxiety, and stress, and an increase of vitality in a cohort of American Indian elder caregivers, 50% of whom had diabetes. (37), (38)

Detoxification

Detoxification is an essential part of a prevention and treatment program. Every culture includes a variety of detoxification methods in its traditional medicine repertoire. Indigenous societies use alterative (blood-purifying) plants; bitter plants to stimulate digestion; and charcoals, fibers, and barks that absorb and eliminate toxins. Many peoples use purge-and-cleanse systems with clays, plant and animal-derived oils, sweats, water therapies, and enemas to detoxify the body and reestablish metabolic balance.

The liver is the major organ of detoxification. Normal liver function is essential for the regulation of blood glucose. Liver detoxification is used to improve liver function and involves two interrelated activities carried out by the individual. The first activity includes the elimination and reduction of exposure to harmful or toxic substances in food or the environment; the second activity requires undertaking specific detoxification methods described below to improve the body's capacity to eliminate toxins. Both activities--elimination and reduction of intake, and active methods to stimulate detoxification--are required for success.

Refined foods such as white flour and sugars, soft drinks, and alcohol are some of the high-priority foods to eliminate. These foods tax the major organs of detoxification, the liver, kidneys, and the colon, and cause inflammation, raising cholesterol and triglycerides. They also reduce the all-important B vitamins in the body. By reducing exposure to external (exogenous) toxic foods and substances like pesticides and toxic cleaners, the burden on the liver is reduced and it can function more effectively.

At our clinic we educate about the appropriate use of detoxification methods and encourage everyone to use a variety of methods for prevention as well as treatment. However, they must be applied appropriately; otherwise detoxification can exacerbate problems. Water or citrus-juice fasts are contraindicated in diabetes. The use of carrots, apples, or beets in fresh juices, while therapeutic, should be monitored carefully, as they are high in sugar. Diluting these juices with water and using them occasionally is a good approach to their therapeutic application in diabetes. Among the methods we recommend are dry skin-brushing, lymphatic massage, castor oil packs, baking soda/Epsom salt baths, liver/gall bladder flushes, colon cleansing, the use of clay externally and internally, sweats, scrubs, hydrotherapies, and coffee enemas.

Conclusion

A comprehensive approach to the prevention and treatment of diabetes incorporates culture-specific methods that are congruent with the individual, family, and community. Many complementary/alternative medicine methods derive from indigenous traditions. Indigenous traditions have much to offer both native and nonnative people alike and are easily integrated with CAM techniques and resources. The Salish peoples of the Pacific Northwest US have a significant repertoire of healing foods, plants, and traditions that have been demonstrated through both indigenous scientific methods and biomedical science to support health and prevent disease. An intensive multifaceted regime is required to restore health or to prevent further decline due to diabetes type 2.

RELATED ARTICLE: Recipe: Health Smoothie for Children and Adults

Use this as a daily drink. It will appeal to children as an alternative to candy or other sweets. Use up to twice per day for breakfast or a snack.

Add the following to a blender:

4 oz. of plain yogurt (without sugar or fruit additives), or water
2 tsp. (heaping) of Nordic Naturals Lemon Fish Oil (2,000 mg. of omega-3s)

Always shake the oil and refrigerate after opening.

Glucose Tolerance Factor (GTF) (Metabol X) *

1/4 frozen banana (peel bananas and place in freezer ahead of time)

1/4 cup frozen raspberries, blueberries, or huckleberries

1 drop of liquid stevia

Add enough water and ice cubes to make either a drink or a thick frozen shake; experiment with the amount of water.

* Metabol X is a comprehensive vitamin-mineral formula rich in GTF, designed for people with diabetes or dysregulated blood handling.

Table 1. Nutritional Supplement Schedule

Nutrient	With Breakfast	With Lunch	With Dinner
----------	----------------	------------	-------------

Psyllium Seed Husks *	1	1	
-----------------------	---	---	--

tablespoon	tablespoon		
------------	------------	--	--

30 min	30 min		
--------	--------	--	--

before	before		
--------	--------	--	--

breakfast	breakfast		
-----------	-----------	--	--

Bio-Glycozyme Forte ** 2 2 2
(Pro-Omega) Fish Oil 3 3 3
Glucose Tolerance Factor + 1 1 1
Gluco Fit (Corosolic Acid) 1 1 1
Adrenal Glandular (AR) 1-2 1-2
Mg-Zyme (Magnesium) 2 2 2
VasculoSirt 2 2 2
Pancreas Glandular (AR) 3 3 3
Pro-Biotic (Ther-Biotic 1
Complete; Klaire)
Rhodiola Extract ++ 30 drops 30 drops
between between
meals meals

[C]2009 Leslie Korn and Rudolph Ryser

Leslie Korn, PhD, MPH

1001 Cooper Point Road SW

140-214

Olympia Washington 98502

360-586-0117

lekorn@cwis.org

References

- (1.) Boyd R. The Coming of the Spirit of Pestilence. Seattle, WA: University of Washington Press; 1999.
- (2.) Duran E, Duran B, Brave Heart MYH, Horse-Davis SY, Danieli Y. ed. Healing the American Indian soul wound. In: Danieli Y, ed. International Handbook of Multigenerational Legacies of Trauma: Croup Project for Holocaust Survivors and Their Children. New York: Plenum Press; 1998: 341-354.
- (3.) Korn L, Ryser R. Burying the umbilicus: nutrition trauma, diabetes and traditional medicine in rural west Mexico. In: Ferreira ML, Lang CC, eds. Indigenous Peoples and Diabetes: Community Empowerment and Wellness. Carolina Academic Press; 2005: 231-277.
- (4.) Kuhnlein HV, Yeboah F, Sedgemore M, Sedgemore S, Man CH. Nutritional qualities of oolichan grease: a traditional food fat of British Columbia first nation. J Food Compost Anal. 1996;9:18-31.
- (5.) Phinney SD, Wortman JA, Bibus D. Oolichan Grease: A Unique Lipid and Dietary Staple of the North Pacific Coast. Urbana, Illinois: American Oil Chemists Society Press; 2008.

- (6.) American Diabetes Association. Using the diabetes food pyramid. American Diabetes Association website. Available at: <http://www.diabetes.org/nutrition-and-recipes/nutrition/foodpyramid.jsp>. Accessed October 28, 2008.
- (7.) Gardner CD, Kiazand A, Alhassan S, et al. Comparison of the Atkins, Zone, Ornish, and LEARN diets for change in weight and related risk factors among overweight premenopausal women: the A to Z weight loss study: a randomized trial. *JAMA*. 2007;297:969-977,
- (8.) Montori VM, Farmer A, Wollan PC, Dinneen SF. Fish oil supplementation in type 2 diabetes: a quantitative systematic review. *Diabetes Care*. 2000;9:1407-1415.
- (9.) Jamal GA. Pathogenesis of diabetic neuropathy: the role of the N-6 essential fatty acids and their eicosanoid derivatives. *Diabetic Medicine*. 1990;7:574-579.
- (10.) Jamal GA, Carmichael H. The effect of gamma linolenic acid on human diabetic peripheral neuropathy. *Diabetic Medicine*. 1990;7:319-323.
- (11.) Enig MG, Fallon S. Tripping lightly down the prostaglandin pathways. *Price-Pottenger Nutrition Foundation Health Journal*. 1999;20:574-7763.
- (12.) Elliott PJ, Jirousek M. Sirtuins: novel targets for metabolic disease. *Curr Opin Investig Drugs*. 2008;9:1472-4472.
- (13.) Labinskyy N. Vascular dysfunction in ageing: potential effects of resveratrol, an anti-inflammatory phytoestrogen. *Current Medical Chemistry*. 2006;13:989-996.
- (14.) Anekonda T, Adams G. Resveratrol prevents antibody-induced apoptotic death of retinal cells through upregulation of sirt1 and ku70. *BMC Research Notes*. 2008;122: 1-12. Available at <http://www.biomedcentral.com/content/pdf/1756-0500-1-122.pdf>.
- (15.) Williams ME, Bolton WK., Khalifah RG, Degenhardt TP, Schotzinger RJ, McGill JB. Effects of pyridox-amine in combined phase 2 studies of patients with type 1 and type 2 diabetes and overt neuropathy. *Am J Nephrol*. 2007;27:605-614.
- (16.) Barclay L. Unique form of B-6 protects against complications related to diabetes and aging. *Life Extension*. October 2008:21-31.
- (17.) Chui MH, Greenwood CE. Antioxidant vitamins reduce acute meal-induced memory deficits in adults with type-2 diabetes. *Nutr Res*. 2008;28 423-429.
- (18.) Lee P, Chen R. Vitamin D as an analgesic for patients with type 2 diabetes and neuropathic pain. *Arch Intern Med*. 2008;168:771-772.
- (19.) Shealy CN, Thomlinson P. Safe effective nondrug treatment of chronic depression: A review of research on low-voltage cranial electrical stimulation and other adjunctive therapies. *Complementary Health Practice Review*. 2008;13:92-99.
- (20.) Tsunek H, Ishizuka M, Terasawa M, Wu JB, Sasaoka T, Kimura I. Effect of green tea on blood glucose levels and serum proteomic patterns in diabetic (db/db) mice and on glucose metabolism in healthy humans. *BMC Pharmacology*. 2004;4:18.
- (21.) Kulkarni AD, Smith RB. The use of microcurrent electrical therapy and cranial electrotherapy stimulation in pain control. *Clin Prac Altern Med*. 2001;2:99-102.

- (22.) Tan G, Rintala D, Herrington R, et al. Treating spinal cord injury pain with cranial electrotherapy stimulation [abstract]. / *Spinal Cord Med.* 2003;26.
- (23.) Schmitt R, Capo T, Frazier H, Boren D. Cranial electrotherapy stimulation treatment of cognitive brain dysfunction in chemical dependence. *Clin Psychiatry.* 1984;45:60-63.
- (24.) Jinfu Z, Xinha J. 2008. Observations of diabetes mellitus treated by Chinese wudang zhonghe qigong (dynamic form). Complementary and Alternative Healing University website. Available at: http://alternativehealing.org/Diabetes_qigong_therapy2.htm Accessed October 10, 2008.
- (25.) Iwao M, Kajiyama S, Mori H, Oogaki K. Effects of qigong walking on diabetic patients. *J Altern Complement Med.* 1999;5:353-358.
- (26.) Kumar D, Marshall HJ. Diabetic peripheral neuropathy: amelioration of pain with transcutaneous electrostimulation. *Diabetes Care.* 1997;20:1702-1705,
- (27.) Julka IS, Alvaro M, Kumar D, Beneficial effects of electrical stimulation on neuropathic symptoms in diabetes patients. *J Foot Ankle Surg.* 1998;37:191-194.
- (28.) Jiu ZZ. Effects of acupuncture on mood and glucose metabolism in the patient of type 2 diabetes. *Zhongguo Zhen liu [Chinese Acupuncture & Moxibustion].* 2007;27:741-743.
- (29.) Zhao JL, Li ZR. Clinical observation on mild-warm moxibustion for treatment of diabetic peripheral neuropathy. *Zhongguo Zhen Jiu [Chinese Acupuncture & Moxibustion].* 2008;28:13-16.
- (30.) Zhao HL, Gao X, Gao YB. Clinical observation on effect of acupuncture in treating diabetic peripheral neuropathy. *Zhongguo Zhong Xi Yi Jie He Za Zhi [Chinese J of Integrated Traditional and Western Medicine].* 2007;27:312-314.
- (31.) Wang YP, Ji L, Li JT, Pu JQ, Liu FJ. Effects of acupuncture on diabetic peripheral neuropathies. *Zhongguo Zhen Jiu [Chinese Acupuncture & Moxibustion].* 2005;25:542-544.
- (32.) Ahn AC, Bennani T, Freeman R, Hamdy O, Kaptchuk TJ. Two styles of acupuncture for treating painful diabetic neuropathy: a pilot randomised control trial. *Acupunct Med.* 2007;25:11-17.
- (33.) Weintraub MI, Wolfe GI, Barohn RA, Cole SP, Parry GJ, Hayat G, et al. Static magnetic field therapy for symptomatic diabetic neuropathy: a randomized, double-blind, placebo-controlled trial. *Arch Phys Med Rehabil.* 2003;84:736-746.
- (34.) Weintraub M. Magnetic biostimulation in painful diabetic peripheral neuropathy: a novel intervention--a randomized, double-placebo crossover study. *Am J of Pain Management.* 2001;9:8-17, quoted in McLean M et al. Static magnetic fields for the treatment of pain. *Epilepsy Behav.* 1999;2:S74-S80.
- (35.) Bosi E, Conti M, Vermigli C, et al. Effectiveness of frequency-modulated electromagnetic neural stimulation in the treatment of painful diabetic neuropathy. *Diabetologia.* 2005;48:817-823.
- (36.) Pawluk W. Pain management with pulsed electromagnetic field (PEMF) treatment. Health World Online website. Available at: <http://www.healthy.net/scr/Article.asp?Id=2263>, Accessed October 21, 2008.
- (37.) Korn L, Logsdon RG, Polissar N, Gomez-Beloz A, Waters T, Ryser R. A randomized trial of a CAM therapy for stress reduction in American Indian and Alaskan Native family caregivers. *Gerontologist.* In press.

(38.) Korn L, Ryser R. Burying the umbilicus: nutrition trauma, diabetes and traditional medicine in rural west Mexico. In: Ferreira ML, Lang GC, eds. Indigenous Peoples and Diabetes: Community Empowerment and Wellness. Carolina Academic Press; 2005: 231-277.

by Leslie Korn, PhD, MPH and Rudolph C Ryser, PhD

Leslie Korn, PhD, MPH, is the director of Health Alternatives LLC and of the Center for Traditional Medicine, an agency of the Center for World Indigenous Studies (CWIS), both in Olympia, Washington. She is a graduate of the Harvard School of Public Health, where she conducted research on traditional nutrition.

Rudolph Ryser is the executive director of the CWIS and an activist scholar in the field of Indian affairs. He learned healing traditions from his Cowlitz mother.

COPYRIGHT 2009 The Townsend Letter Group

Copyright 2009 Gale, Cengage Learning. All rights reserved.

Many Indigenous communities have families with high rates and high risk of type 2 diabetes. If you are in a community with high rates of diabetes, see a health-care provider to learn about ways to be tested for and prevent diabetes. The causes of diabetes are complex. Learning about the medical, social and cultural contributions to diabetes is key to diabetes prevention. In particular, seek to understand the relationships between the history of colonization and the current high rates of diabetes in Indigenous peoples. Ask about community initiatives that promote healthy behaviours, such as dia... Strategies of diabetes prevention should aim at promoting a "diabetes-protective lifestyle" whilst simultaneously enhancing the resistance of the human organism to pro-diabetic environmental and lifestyle factors. More research on diabetes-protective mechanisms seems warranted. Environmental/lifestyle factors in the pathogenesis and prevention of type 2 diabetes. Hubert Kolb. ORCID: orcid.org/0000-0003-0768-628X1,2 & Stephan Martin1,2. BMC Medicine volume 15, Article number: 131 (2017) Cite this article. 19k Accesses. 87 Citations. Type 2 diabetes (T2D) is a major global health problem and prevention could be improved by identifying individuals at risk at an early stage, followed by preventive strategies, e.g., dietary modifications. Untargeted LC-MS metabolomics offers the possibility to identify predictive biomarkers that may improve risk prediction and dietary biomarkers that may facilitate investigation of diet-T2D relationships. However, untargeted metabolomics generates large-scale data, resulting in demanding data processing and statistical analyses preceding meaningful biological interpretation. Conclusions CeNPs will be useful in developing strategies for the prevention of T2DM. View. Show abstract. Among these medicinal plants, curcumin is gaining a growing interest in the scientific community. Curcumin is a bioactive molecule present in the rhizome of the *Curcuma longa* plant, also known as turmeric. Curcumin has different pharmacological and biological effects that have been described by both in vitro and in vivo studies, and include antioxidant, cardio-protective, anti-inflammatory, anti-microbial, nephro-protective, anti-neoplastic, hepato-protective, immunomodulatory, hypoglycaemic and anti-rheumatic effects. In animal models, curcumin extract delays diabetes development, improves β -... Curcumin and Type 2 Diabetes Mellitus: Prevention and Treatment. by. Francesca Pivari.