



Medicines between Two Worlds

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Introduction

The Diné (Navajo) Nation covers about 27,000 square miles, occupying parts of northeastern Arizona, southwestern Utah, and northwestern New Mexico. It is nearly the size of West Virginia and has about 300,000 enrolled members, 58% of whom live on the reservation. There are estimated to be 6 hospitals, 7 health clinics, and 15 health stations provided by the Navajo Area Indian Health Service (NAIHS). The health clinics are open full time and, in small communities, the health stations operate only part-time. The majority of the population residing within the small rural communities has to travel fifteen to fifty miles to get to the nearest health clinic when the local health stations are not in service. There are also private health care providers on the Diné Nation like private hospitals, chiropractors, dentists, and optometrist and traditional medicine men, hand tremblers, and herbalists. According to the Office of Native Healing Science's registry, there are about 1,029 Navajo practitioners (medicine men and women), hand tremblers, and herbalists currently practicing traditional healing.

A traditional sick person will see a medicine man, hand trembler, or crystal gazer (in Diné meaning 'the one who knows') to determine the causes of an illness in order to cure it. A hand trembler says a prayer to the Gila monster's spirit, asking for information about the sickness and its cure. (1) The Gila monster is believed to know and see everything, and he taught hand trembling to a person who has wisdom beyond the five senses, and the people know this because the monster's forefoot shakes when he lifts when walking. The trembling feeling resembles a tingling sensation or an electric shock. A person must have good thoughts to have the signal which is called *hoyee*'. A crystal gazer is a person who uses clear quartz and will perform a short ceremony looking into the stone while chanting. When the illness is determined the sick person will see a Navajo medicine man/woman or an herbalist who use herbs, prayers, and songs to prescribe and heal the patients' ailments.

Overview

Some Diné have adopted Western medicine and at the same time utilize the Navajo healing and ceremonies, which have improved their quality of life. However, it has been not easy preserving the old ways while adopting the new ones. The new culture's preference of fast food, urbanization, and technology make it difficult for the young generation to learn the traditional ways. Although there are changes and adaptations, the old beliefs, practices and traditional ceremonies endure among the Diné.

I am an example of not learning my culture, language, and traditional beliefs and practices because my life when I was young was merely surviving to find the next meal and another place to sleep for the night. Marrying into a family with very strong traditional practices and beliefs gave me a multitude of experiences of how traditional living should be instead of living the fright and flight survival life. The many nuclear and extended family ceremonies and practices I learned and used for many years, along with various Diné literature and interviews, gave me self-confidence as an educator to teach our children Diné philosophy. I have extended my experience to my students in the educational realm within the many classrooms I have taught throughout my teaching years.

A majority of our Diné students are losing their culture, language, and traditional beliefs. But there are a few who solely believe in and practice our traditions. Others prefer a varied mixture of traditional and western medicine or practice solely western medicine. This school year I had an experience in assisting one of my male students. He had missed two weeks of school and I was worried he was getting behind with his schoolwork. His family informed me he had burned his foot on the heel and ankle. I informed them he is getting behind, so the family and I discussed the traditional procedure for the treatment of his burn. I was therefore able to assist them with their child while he attended school. Traditional healing is a holistic process focusing on the entire individual, combining the educational, religious (spiritual), family, medical, and cultural aspects when healing the sickness. It is called *hozho*, defined as harmony, order, balance and beauty.

Rational

Although students in my classroom have varied beliefs, I want them to know that they are able to use both worlds of medicines. Students will use my experience and other scholars who have continued their education in Western medicine and have become doctors in medicine who made a difference in accepting traditional healing. Navajo doctors, like Dr. Joachin Chino, who is Navajo-Acoma and is chief of surgery at the Tuba City Regional Health Care Corp., Dr. Michael Tutt, in the medical field in rheumatology and internal medicine at Fort Defiance, Dr. Patricia Nez Henderson, the first American Indian woman to graduate from Yale University School of Medicine, and Dr. Mary Roessel, a psychiatrist in Santa Fe, are a few examples of many Diné doctors. I want my students to share their learning from the classroom with relatives at home about the changes that are happening within the medical field of modern and traditional medicines. I want them to understand that treatment of the whole body, and not just part of it, is more beneficial. Students can accept and use the modern changes and still use traditional healing. Learning is holistic: it is around, above, below, behind, in front and inside of each student who wants to learn and help their people. Students need to know modern medicine and traditional medicine have various degrees of sacredness. Protecting and respecting the

sacredness will give the medicine value and belief of healing for the whole person (physical, mental, emotional and spiritual) and not just parts of the body.

Background

The unit, Medicines between Two Worlds, will be a fifth grade science unit. The majority of my students are Navajo. The unit will integrate social studies - culture, history, geography, health and dine' philosophy of education standards. It will cover the course of four weeks for approximately fifty-five minutes a day.

Western medicine had little impact on the Diné until the forced removal in 1864 to Fort Sumner. The army provided a few doctors with a small building for a hospital but it was not enough with the overcrowding of 8,000 Navajos. Vaccination was the only method Diné viewed as useful because other treatments were painful and did not produce the desired results. The treaty of 1868 promised to provide a physician, but it did not happen. Eventually the government established the Office of Indian Affairs (later known as Bureau of Indian Affairs). As late as 1900, the Medical Division had only eighty-three physicians-enough for only half of the Indian agencies. (2) The main medical facility was at Fort Defiance, which was the center of the 1868 reservation. Yet, the majority of the Diné lived miles away and therefore the majority of them used local traditional practitioners. The government eventually accepted assistance from the local traders and the missionaries.

Trading posts were commonplace, where people gathered and the traders were non-Indians who provided consumer goods and some basic medical services. Missionaries from the Protestant church were the first group to introduce Western medicine. Eventually other denominations settled and provided their staff and hospitals on the reservation. The various denominations had intentions of eradicating ceremonial healing and traditional ways. The missionaries' goal was to "...be a missionary and then a doctor," and medical service "is and must always continue to be a preparer of the way for the message of salvation." (3) Diné healers and patients noticed the missionary's intent and eventually patients stayed away from the hospitals. So begins the loss of trust from the missionaries' practice of Western medicine because of their cultural and religious arrogance of Navajo traditions.

Finally the government established hospitals on the reservation, creating more factors of suspicion, disbelief and doubt. The boarding school confined children, causing illnesses such as tuberculosis (TB) and death, then the influenza epidemic struck the Navajos between October 1918 and the end of 1920, killing over two thousand. (4) Despite the loss of trust of doctors' attitudes toward traditional healing, Diné healers were aware of the tension that created a battle line between them. Some healers ignored the doctors and others have respect for them because doctors are healers, too.

Geography

Medicinal herbs are found within the four-corner region known as the Colorado and Green River Plateaus, the New Mexico and Arizona Plateaus and Mesa, the Black, Hualapai, and Cerbat Mountains and the Arizona and New Mexico Mountains. These plateaus, canyons, and mountain ranges are attributes that cluster the states of Arizona, Utah, Colorado, New Mexico and Texas, which frame the Southwest. The range of the Colorado and Green River Plateaus is located in the north and northeastern part of the state with leveled and sloping

plateaus with plains and canyons and short mountain ranges. The elevation range is 4,500 to 7,500 feet and soils range from deep alluviums to shallow rocky areas. (6) The climate is temperate cool with precipitation averaging from 6 to 20 inches per year. (7) The New Mexico and Arizona Plateaus and Mesas have similar land formations like the Colorado and Green River Plateaus but have in contrast an abundance of vegetation. The precipitation averages 10 to 13 inches per year and 15 inches in the higher elevation, which ranges from 5,000 to 8,000 feet with a cool temperate climate. (8) The Black, Hualapai and Cerbat Mountains ranges in the northwestern part of the state with the Grand Canyon and the Colorado River. (9) The land formation with this area consists of wide valleys, steep plateaus and mountain elevations from 2,500 to 8,000 feet. (10) The climate is cold to temperate warm with a precipitation range from 6 to 20 inches. The Arizona and New Mexico Mountains cover a wide strip from the northeast Kaibab to the southwest middle portion of Arizona's San Francisco Peak forming a diagonal mountain range through the state into New Mexico to the Mogollon Mountains. The land formation consists of rolling plains, hills, and mountains with elevations ranging from 33,000 to 12,600 feet. The average precipitation is from 11 to 40 inches per year with temperatures from mild to very cold. (11)

Various soil textures have average consistency within the top six inches of topsoil. (12) The clay soil includes clays and silt. The loam soil includes silt clay, clay, and sandy clay, silt, and sand. Sandy textures include loam, and sand. Soil is one variable that will determine the amount of plant species located in an area because soil contains chemical composition like acid or alkaline. (13) The southwest has a minimal amount of water, which is available for a short time, so plants will have to adapt and conserve moisture which will sustain it during long droughts. Since water is minimal, chemicals in the soil do not seep away compared to areas where precipitation is high. The result is rich soil content, which produces vivid colored flowers. The elevation effects the plant populations like areas with consistent water flow from underground aquifer and mountain runoff onto flat plains. The growth patterns change at the cooler levels and numerous plants thrive.

Herbs

Specific herbs grow only in certain places, so the medicine man or herbalist has to travel long distances to search for and collect the herbs. Some herbs are seasonal plants and become difficult to find because of the limited amount available. The rainy season is a factor when plants are plentiful or not during a dry season.

The process of collecting plants requires certain precautions, because a song and a prayer must be conducted, then corn pollen and a jewel (turquoise, shell, or abalone) are given to it. It is said, "If you take you must give something in return or you will hurt the plant or the earth" and "you must ask permission of the plant or the medicine will not work." Medicine men or herbalists will only pick what is needed even though they traveled great distance, like to the mountains or into another state. The Holy people created the plants when they were living on earth and were tested on the first patients. Ultimately, the plants were left for the Diné to use for sickness and ailments.

The Diné concept of plants is grouped into categories: sex, ceremonial and herbal usage. Diné's ideology of sex is in all aspects of life, on earth, and above earth. As Diné, we have male and female characteristics; there are male and female ceremonies, male and female rain, male and female plants. The sex of the plant is identified by the size of the leaves, flower, and stem. The ceremonial medicines are used to heal sickness during a specific ceremony. The herbal plants are prescribed from an herbalist. The healing process requires time and treatment is a slow process, requiring days or weeks, demonstrating respect to the herb. When it is a ceremony it involves taking time out from the daily activities for reflection, emotional healing and awareness. The medicine will spend a great deal of time with the person during days of the ceremony. Healing is holistic:

relatives and family members assist with specific ceremonial tasks.

The following paragraphs will explain the function of traditional herbs as liquids, poultices, pastes, and powder or lotion medicine using the scientific plant classification. Students will learn how traditional healing helps heal burns, broken bones, stomach aches, urine infections, and sore throats and are described as how plants are classified: class, subclass, super order, family, subfamily, tribe, sub-tribe, genus, species, variety, form, and cultivar.

Burns

The class *Magnoliopsida* is a dicotyledonous, and in the *Abronia fragrans* Nutt. (14) It is in the Nyctaginaceae family known as the Four o'clock family. (15) For example, Hook - Snowball (shape) sand verbena is a perennial plant, with a reddish stem base and nodes. The leaves are about 0.5 to 8 cm. long. The herb flowers during spring and fall seasons in dry sandy soils, shrub and grasslands. The flowers are found in the four-corner states and in the plains states and in Mexico (Chihuahua). Preparations include powder, poultices, ointments (with sheep grease and red ochre), and infusions for lotions. These are also used for sores. Diné use an herb for burns and scalds, known as the fire medicine (azee' tlid).

The plant class is *Magnoliopsida*, a dicotyledonous, within the Cactaceae Family, Species *Opuntia laevis* J.M. Coult. - Tulip prickly pear. (16) The flower buds are used for burns, also known as Prickly Pear Cactus (hxosh azee'). The stem segments are broad, oval or circular about 0.5 to 11 cm wide and 6-13 mm thick. There are two kinds of spines on the oval shape cacti which are yellow-brown to gray areoles, one is a major spine and the other is a minor spine, which is white. Spines near the areoles are long, flexible and curly. A cactus is easy to identify and has a berry like fruit with many seeds. The bud fruit is juicy and sweet. The cacti will flower in late spring (April, May, and June) and are found on grasslands, pinion-juniper woodlands, and on clay, sandy or gravelly soils. It can survive in low water areas and can tolerate the heat and dry soil. They are found in the Midwestern states and Western Canada. It is used for first aid as an anti-inflammatory medicine. The buds are applied on the wound and covered.

In a Class *Magnoliopsida* - Dicotyledons and from the Family *Scrophulariaceae* - Figwort family Genus *Penstemon* (in Greek means five stamens- four are fertile and one is sterile) Schmidel - beardtongue Species. (17) Sometimes called southwestern penstemon -*Penstemon barbatus* (Cav.) Roth, and looks like a fuzzy two-lipped tubular flower (the sterile stamen has a tuft of small hairs) known as Beard lip Penstemon. (18) It is a clump-forming perennial plant and typically grows to about 2 to 3 feet in height with rigid stems and spreads 1 to 1.5 feet in diameter. The leaves and stem contain a white bloom. Blooming months are during May to June with flowering colors of Rose red, which makes it bright and easy to distinguish when searching known as *azee' lichii doo jidi tsooh*. The flowers need a full day of sun and a minimal amount of water. It is able to survive in dry soil, shallow and rock soil and drought climate. The native range for the plant is within the four-corner states. The Navajo use the flowering plant to dress a burnt wound using a cold press with powdered plant to covers the burn.

Broken bones

The Class *Eriogonum multiflorum* is from the *Iachnorlynum* (buckwheat family) which is the *Polygonaceae* and *Boraginaceae* (Spurge family); one species from the Euphorbiaceae (*Ditaxis cyanophylla*) (19) is an important similar plant when performing a ceremony. Life Way ceremony is commonly conducted when using herbs, which is widely used among medicine men. There are numerous botanical species that are appropriate for this preparation: certain ones are considered basic, and the ceremony lasts an hour or two. Healing plants for the

same family are found and added as combination herbs. Pollen is placed upon one of the same species, from east to west, from south to north, and twice around it clockwise, while praying. The root of the desired specimen is dug up, pollen is placed in the hole, the top of the plant is broken off and pollen placed on the bottom of the stems, the top is replanted in the hole, with pollen placed on the top. Prayers to the plant and for its continued growth are said. If the top is not replanted, pollen is placed in the hole and the earth is carefully smoothed over it so as to leave no trace of disturbance, while praying for more to grow. Sometimes the plant is not uprooted but side roots are broken off, pollen placed on their ends and on the broken stub ("to make it grow"), and the plant left with accompanying prayers. Roots gathered this way are called "life medicine" and are thought to be more powerful, so powerful that one treatment is recommended for the fracture. The two plants are bind with roots on the right and left sides (south and north) and two of another herb on the front and back (east and west) of a fractured limb. (Shaped splints of cottonwood may also be used, tied with *Equisetum* sp.) Then the roots of *Lithospermum angustifolium* are inserted inside the handle of a ceremonial rattle and on other objects during a Flint Way Ceremony. The Dine name "life medicine" (*iina-ji'azee' doo azee' nitl'inii*) may be used for any of the plants in this group. Usually the roots only of the plants are used, being dried and ground by a young person during a Life Way ceremony with accompany of songs. Life Medicine and Life Way ceremony is used to treat sprains, strains, fractures, swellings, bruises, wounds, burns, lameness, internal injuries, body pains, and any other injury from accidents, which is like a cure-all. It is administered internally as cold or warm water mixed with the dry powder herb, is applied to injured parts as a hot or cold poultice (think of a lotion), and sometimes the roots are chewed. Because of the numerous uses of species obtained only those recommended by medicine man or herbalist are best to use.

The *Astragalus* is from the pea family, flowering five petals containing ten stamens and one pistil. The pistil develops into a pod. *Astragalus crassicaarpus* commonly known as ground plum having curve shape fruit similar to a shape of an ankle bone like a cube dice. The fruit also has a thick wall. Milk Vetch and Locoweed are common names for this genus group. Livestock like sheep are kept away from the area. The poison is selenium, which is from in the soil. The plant is known as *ho cho'oxigii azee'* or *iinaaji azee'* which is bitter with a strong flavor. The leaves are 3 to 4 inches wide with white flowers. The leaves are press onto the injured bone area and wrapped with a cloth. Then heat is applied to injured area four times a day for two weeks.

Gaura parviflora is from the evening primrose family. It contains four sepal, petals, and stigmas with eight stamens. The *scarlet gaura* grows in a barren or overgrazed flat plain in the semi-high desert grassland. The stem is smooth, covered with dense hair. The leaves are slender and thickly covered with hair, too. The flowers are pink during the first early bloom then when fully bloomed they turn red.

Artemisia tridentate known as the big sagebrush is within the composite family. The compositae is known as a large seed group. The inflorescence is called the head with numerous flowers. When splitting the head of a dandelion or a sunflower, a tight strapped corolla of five fused petals is exposed showing the short tube at the base. Inside of the base is a ring of five stamens with the ovary at the bottom of the tube. A head of a sunflower discloses two kinds of flowers. One kind has the tightly strapped corolla of five fused petals located on the outside of the head. The other kind does not have strapped corollas and the petals are joined in random symmetrical like rows of teeth. The big sagebrush is a shrub with many branches and varies in height from 12 to 133 cm. It is an inhabitant of high mountain deserts.

Stomach aliments

The Class *Magnoliopsida* a dicotyledonous is from the *Euphorbiaceous* Spurge family. The species are *Chamaesyce Arizonica* (Engelm.) Arthur-Arizona sand mat. (20) Stomach-ache (*bidini doo ts'ah dinii azee'*) is

abdominal pain attributed to any cause from virus or bad bacteria from the surrounding environment. These plants are brewed and ingested, used to ease or heal the pain during a Chant Way Ceremony.

Various small species of *Euphorbia* seem to be widely used for abdominal pain. Decoctions are most commonly used. Various plants are recommended for anorexia, gas, eructation, heart burn, as well as for pain and acute or chronic indigestion. The plants are annual or perennial herbs. The woody shrub or tree has a poisonous milky sap. The roots and stems are fine, thick or tuberous. They are 15-91 cm tall with deciduous leaves. The leaves are opposite, alternate or in whorls. The plant species leaves are mostly small and have a short-live span. The stipules are mostly small, which changes into spines or glands or is missing. All members of the *Euphorbiaceae* family-spurges have unisexual flowers. (21) The majority of species have male and female flowers on the same plant. Sometimes young plants or those growing under harsh or hostile conditions are male, when conditions improve female flowers in the cyathia will produce and grow. The leaves have bright colors and the fruits are produced in threes from compartment capsules. The fruits are fleshy and ripen from a woody container that splits open explosively. The seeds are four angled, oval or spherical.

The Desert Barberry is grouped in the Species of *Mahonia trifoliata* in the class of *Magnoliopsida* and in the *Berberidaceae* family. (22) The *Mahonia trifoliolata* is a flowering plant found in Arizona, New Mexico, and Texas and in northern Mexico. Common names include Agarita, Agrito, Algerita, Wild Currant and Chaparal Berry. (23) Agarita is a rounded evergreen shrub that grows up to about 1.8 meters tall and wide. The plant is able to live in drought areas and has a very high heat tolerance. The fruit is a red berry containing slightly sweet or sour juices with seeds and yellow flowers that grow in clusters. The undergrowth is gray-green, and the leaves have sharp points at the ends. The bright fruits are produced around late April to early May. The Navajo use the berries, stem and root bark for intestinal tract ailments. The poultice is a bitter tonic.

Urine infections

Diuretic plants are used during ceremonies for specific healing purposes. Kidney and bladder disease may be attributed to red ant, snake, or deer infection. It is treated by Red Ant Way, Beauty Way, or Plume Way (with Game Way plants). Diuretics are recommended for venereal disease, hematuria (blood in the urine), pelvic pain, and bladder stones as well as for anuria (inability to produce urine and waste build up in the blood). *Hieracium* known as hawkweed (tsidii ch'il) is in the *Asteraceae* family related to the dandelion. It is a large family of flowers that reproduce asexually by means of seeds that are genetically identical to their mother plant. The flowers-heads have mostly yellow tightly packed small flowers strapped at the stem. The leafy brackets hold a complete flower in itself. The small, three-fourth inch red orange flowers are scattered with very similar yellow ones, and often the white of daisies. Decoctions are made from the plant and ingested.

Arctostaphylos is a genus of plants of manzanitas and bearberries. They are shrubs or small trees growing up to six meters tall. They are from the *Ericaceous* family grouped into about sixty species. Most are evergreen with small oval leaves 1 to 7 cm long stems. The flowers are bell-shaped, white or light pink in clusters of 2-20. They bloom in the spring and the fruits are small berries that ripen during the summer or fall. Some berries are edible depending on the species. The *Manzanitas* are found throughout the United States and northern and central Mexico. The species of berry are Alpine, Red, and Common Bearberries.

Depending upon the severity of the infection the pain intensity has different variations. The plants are known as *atsa' azee'* and are ingested. The liquid mixture is brewed and drank until the flavor is depleted. The plant is also used for healing athlete's foot, surgical healing, and sores on the skin. To heal sores on the skin, the plant must be chewed into a pulp then spit out then applied on the sore. The herbalist says the saliva and the plant creates a medical healing poultice.

Sore throat

Eagle Way, Bead Way, or Plume Way Ceremonies may be used to treat sore throat, so plants pertaining to these chants may be used. Medicine men know the pain properties of the plant and use it as an analgesic for hip and back pain and pregnancy. Decoctions are drunk and applied as lotions and poultices of the plant are applied to the throat and other areas to relieve pain. There are a variety of species of *Eriogonum* that populate the Southwest region. They have diverse characteristics and are difficult to identify. Most grow 6 to 30 cm in height and have slender branches that divide into fork pairs. Small flowers are clustered like an umbrella plant. The common names for the *Eriogonums* are wild buckwheat, winged buckwheat, and skeleton weed.

There are about 125 species of *Oenothera* from the Evening Primrose Family. (24) Known as evening-primrose, suncups, and sundrops. Varying in size from 3 to 10 cm, the leaves are lobed edged with pointed or tooth-shaped projections. The flowers open within less than a minute in the evening. White flowers are the most common species in the southwest with yellow the next common color the some purple, pink or red. A unique distinctive feature of the flower is the stigma with four branches for an X shape. The seeds ripen from late summer to fall. The *Oenothera* act as a colonizer; it tends to germinate on sand dunes and along dirt road and highways. *Oenothera* grow in temperate regions. The young root shoots can be eaten and used to heal other body ailments. The mature seeds contain 7 to 10 percent of oil, which is 70 percent linoleic acid. The oil is used to reduce the pains of premenstrual stress syndrome, itching, sore throat and bloating gases in the stomach.

Chilopsis is a flowering plant containing one species *Chilopsislinearis*. It is a small tree native to the southwest and Mexico known as the desert willow tree. The willow-like leaves are from the *Bignonia* Family, *Bigoniaceae* are commonly seen in washes and long river banks. The elevation range of willow trees is below 1,500 feet with a height ranging from 1.5 to 8 meters. It is either a shrub or a small deciduous tree and its leaves have liner curves ranging 10 to 26 cm. The flowers resemble a lip which blooms in May and progresses into September with 2-4 flowers open at one time. The sepal is about 8 to 14 mm, slightly inflated with various shades of purple. The corolla, which is the inner flower, is 2-5 cm with colors ranging from lavender to light pink. The flowers are large and can tolerate hot and dry climates. Navajo use the leaves and flowers for antifungal treatments, and sore throats.

The next paragraphs will describe the function of Western medical treatment for burns, broken bones, stomach ache, urine infection, and sore throat. Students will learn how local clinics and hospitals treat injuries and ailments.

Burns

When an individual is admitted to the local clinic or hospital on the Diné Reservation the patient is treated using western medicine. A burn for example is identified by the degree and depth of the skin is damaged. The degree of the burns is described as first degree burn, which is identified by the reddening of the skin, swelling, warmth, tenderness and pain. The second degree burn is deeper into the skin with open wounds, blisters and intense pain with redness. Third degree burn is deeper into the skin effecting muscles, bones, and damage to the nerve. Since there are damaged nerves there may be no pain. The area of the burn is important because if the burn covers a large are of the body it is more likely to be fatal than a small third degree burn.

If the burn is minor the nurse will apply ice or cold ice water until the pain lessons, then the area is cleansed with soap and water and covered with sterilize gauze. The patient is given aspirin to relieve the discomfort.

Then topical antibiotics are used to prevent infections and bacteria growth. Neosporin is applied to the skin of the affected areas.

If the burn is extensive or severe, doctors need to quickly relieve the pain, prevent shock, and prevent infection. (25) To relieve the pain the doctor will need to eliminate the air by covering the area with a thick dressing with a clean tightly woven material like sheets or towels. It is important to never pull burnt clothing away from the burned area and is it best to cut away the material. Sometimes physicians will remove the clothing later. It is important to not apply any ointment, grease, powder, salve or any medication on the burn. To prevent shock, make sure the patient's head is lower than his/her feet. Make sure the patient is covered sufficiently to keep warm and provide liquids as long as the person is conscious and able to swallow. As the wound begins to heal it will blister so do not open or burst the blister. Do not allow any unsterile matter to contact the burn area because coughing, sneezing and even breathing within the area of the wound will result into serious infection. Microorganisms from the mouth and nose are contaminations to the burn area. *Silvadene* is a common topical cream that is used on severe second and third degree burns. *Silvadene* is a sulfa medicine used to prevent and treat bacterial or fungus infections.

A serious burn involves long-term treatment beginning with removal of samples of skin from areas of the victim's body. Laboratory technicians will collect the sample skin and grind up the healthy skin and separate them into groups of cells. (26) If the cells are collected in flasks bathed in a growth-stimulating solution, the cells will grow rapidly and divide into colonies doubling in size every 17 hours. (27) New skin forms and the procedure will repeat until enough has been growth to cover the burned areas. Most skin grafts are samples from the patient's own skin so the body does not reject it.

Doctors will prescribe pain medications for patients who have suffered from serious burns to control pain like Morphine sulfate, Vicodine and Demerol. These analgesics are used for pain control and to ensure that the patient is as comfortable as possible.

Broken bones

A broken bone is called a fracture. A break is called an open or compound fracture. It is when one or both ends of the broken bone pierce the skin. A closed or simple fracture is when the broken bone does not pierce the skin. When an individual is injured with a broken bone do not move or help the person up. The person will feel extreme pain or the injured area will swell up. The first step is to apply a splint using something rigid and the appropriate length to support the fractured part. The rigid item needs to be tied above and below the injured area then at the break site. If the break is an open or compound fracture, the person's clothing covering the wound needs to be removed because pressure over the wound needs to be controlled using a clean material.

When the individual with a hand fracture sees a doctor, the doctor will x-ray the fractured site to determine if the injury needs surgery or a cast. If surgery is needed then small metal pins are used to hold the small bones in a stable position. The metal pins remain on the bones for several weeks while the fracture heals, then are removed. This procedure is conducted with the patient under anesthesia. A cast or splint is used when the fracture is still in its proper position. A doctor will prescribe pain medications while the bone heals. Medications like strong dose of acetaminophen (Tylenol #3), morphine, or dilaudid are used for pain management.

Stomach ailments

Stomach ache is one cause of abdominal pain which usually temporary and involves other symptoms. Most of

the causes are not serious and can be easily diagnosed and treated. However, some pain can be a sign of a serious illness. It is important to recognize symptoms that are severe and know when to call a doctor. Common pains are mild stomach ache or cramps caused by indigestion, constipation, stomach 'flu', menstrual cramps, food poisoning or allergies, gas, lactose intolerance, ulcers, pelvic inflammatory, hernia, and other ailments that affect the digestive and pelvic regions. Major symptoms of abdominal pain that are severe require the attention of a doctor. These include pain accompanied with fever, vomiting blood, bloody stools, difficulty breathing, inability to keep food down for several day, inability to pass stool, an abdomen that is tender, and injury to the abdomen from the previous days, pain lasting for several days. These symptoms require treatment and are an indication of internal problems.

There are so many possible causes of abdominal pain, the doctor will need to conduct a thorough exam and ask questions about the symptoms. Questions like the intensity, duration, location, time frame, injuries, and pregnancy. After questioning and evaluations have been completed the doctor will proceed with tests to help diagnose the pain. The tests may include stool and urine test, blood test, x-ray, ultrasound or a CT scan. Then the treatment of the pain depends on its cause, which can range from medications for inflammations or ulcers, antibiotics for infections, changes of diet caused by certain foods or liquid intake. Sometimes surgery is required like appendicitis or a hernia.

Over the counter medications for common abdominal pains include: Pepto-Bismol (diarrhea-causing bacteria), Mylanta, Beano (gas, bloating), Advil or Ibuprofen (cramping), Prilosec (reflux when acid travels from the stomach to the esophagus and throat; unlike heart burn, it can give you pain in your chest, a sore throat, or coughing attacks), ginger tea (nauseated), milk (heart burn), fiber intake or Metamucil (constipation). Severe abdominal pain is determined by the diagnosis then medication is prescribed according to the symptoms.

Urine infection

A urinary tract infection is an infection involving the kidneys, ureters, and urethra. The structures assist the flow of urine passing through before being eliminated from the body. Urine infections are more common in females than males. The reason is the difference of the anatomic structure of the female urinary system. Females have a shorter urethra than males. An infection occurs when bacteria get into the urine and begins to grow. It starts from the opening of the urethra where the urine leaves the body. A common bacteria causing urinary infection is called *Escherichia coli* also known as *E. coli*. These bacteria usually live in the colon and around the anus and can move from the area to the urethra opening.

The most common causes are poor hygiene and copulation. The bacteria can travel up the urethra to the bladder where bacteria can grow and cause an infection. The infection can spread further up into the ureters and if it reaches the kidneys, it can cause kidney infections when can become serious if not treated quickly.

The signs and symptoms are when the urethra and bladder becomes inflamed and irritated causing pain or burning during urination. The like frequent urination, the urgency of having to urinate, not being able to urinate easily or completely, cloudy or bloody urine, bad-smell, lower abdominal pain, or a mild fever and chills are other urinary symptoms. The doctor will obtain a sample of the urine to conduct a urinalysis for signs of infections like the presence of white blood cells and bacteria. After the lab test results, recommendations usually include antibiotic medication and a pain reliever to ease the pain will be prescribed, and to drink plenty of water. Phenazopyridine (Pyridium) is an additional medication combined with the antibiotic for pain. Drinking cranberry juice has been show to prevent urinary tract infections because evidence that cranberries reduce the risk of bacteria adhesion to bladder cells.

Sore throat

Sore throats are usually named for the area surrounding the throat. For example, pharyngitis is inflammation of the pharynx, which is the area of the throat behind the mouth where food, liquids and air flow. Tonsillitis is usually the inflammation of the tonsils. Laryngitis is pain and inflammation of the larynx associated with a hoarse voice and cough making it difficult to inhale air. The larynx is the top portion of the windpipe known as the trachea, which prevents solid food or liquid to enter. The epiglottis is a rare type of sore throat, which inflames the epiglottis. This sore throat is serious because it causes the airway to quickly become blocked.

Sore throats are mainly caused by viruses (known as infectious mononucleosis) or bacteria (known as strep throat - streptococcal). It can be also caused by chemical inhaled like toxin (cigarette smoke) injury, allergy and cancer. Some medical treatment can cause sore throat, too. Sometime sore throats can be caused by other symptoms that occur throughout the body like a fever, headache, nausea, and disease, which carry viral and bacterial infection.

Evidence of sore throat includes pus on the tonsils, redness of the pharynx, tender and swollen lymph nodes in the neck, drooling and spitting because swallowing is painful, difficulty breathing, and bubbles of fluid in the oral cavity.

The duration of a sore throat depends on the cause. If the cause is constant irritation the sore throat can last longer resulting from prolonged exposure to toxic substances like cigarette smoke. Bacterial infections like strep throat will heal when treatment of antibiotics is started.

When the sickness is bacterial infections, it is important to seek a doctor. This can be indicated by symptoms like severe sore throat without a cough, a fever of over 100 F, sore throat with headache, abdominal pain or vomiting, drooling, and close contact with other individuals recently diagnosed with strep throat. Or if a person seems dehydrated and the pain is not relieved by over-the-counter drugs or the person cannot sleep because of the pain. These symptoms are indicators that medical help and maybe hospitalization is needed.

The patient's history and a physical examination are the most important tools in diagnosing certain ailments. An x-ray, a blood count, and antibody test are helpful when confirming the diagnosis. A throat swab to check for infection is a useful choice when selecting a diagnosis. When the doctor knows the patient's history a prescription of an antibiotic and an examination can be a sufficient solution. A throat culture is a reliable test to check for correct results because it takes 24 hours for the evidence to return. Treatment can be delayed or can begin, then ceased when the result are found. So the cure depends on the exact cause. Antibiotics can cure bacterial infections but are not effective when the infection is viral. There is no medical cure for sore throats caused by viral infections. Support and care is usually all that is needed.

Treating the pain is the priority of a sore throat. Some self-home care will help alleviate the pain. Common remedies like throat lozenges, gargling with salt water, aspirin, ibuprofen, and naproxen are effective pain relievers, drinking plenty of fluids is important (soup, sugar-containing liquids, no caffeine), and extra sleep which promotes rapid recovery especially if virus is the cause.

Health

The health and philosophy portion of the lessons will explain traditional life: how Navajo youth prepare their life from a child to youth, adulthood, and to old age. They will learn that changing their life style to traditional diet, fitness, and healing will benefit them for long life. They will recognize cultural values regarding physical

endowment, capabilities, motivation, personality, attitude and behavior in individual development (e.g., early to rise, exercise, meditate to get in touch with the emotional-spiritual self and form healthy eating habits). Students will promote positive attitudes toward conserving the top soil, trees, air, medicinal plants, and water through active participation and presentations. Students will also understand the rights and responsibilities to self, to others, to the upkeep of the natural world; to strive towards self-control: emotionally, mentally, spiritually and physically in according to the concepts of Navajo Philosophy of Life.

The unit will teach students there is good in all things that come into our lives as Diné, with the four sequential processes of life: *nitsahakees* (consciousness and thought), *nahat'a* (planning or action), *iina* (purpose, life, or existence), and *siihasin* (stability, durability or balance) will help our students prepare for life. When learning old and new ideas, they will be balanced. It is important not to tip the scale of preference for one and not the other.

Both Traditional healing and Western medicine are different and both have a variety of styles, beliefs and practices. Both help us with the complex and ever changing views of health and illness. Diné are known for their willingness to change and they have always incorporated change. For example, hospitals on the Diné reservation currently have a Hogan for combining traditional healing and western medicine. The Hogan is a sacred home for a Navajo family. They practice and perform their traditional ceremonies to keep themselves in balance. The doorway faces and opens to the east so the morning sunbeams enter the home which is a good blessing. The feeling of home in Hogan produces spiritual rejuvenation for the individual who is at the hospital.

Family participation from parents, grandparents (*chei doo nali*), uncles and aunts will assist their child to learn about natural herbs for healing and their experience utilizing both traditional and western medicine. Constant home-school connection will be encouraged. Community participation like the Indian Health Service (doctors, nurses, and community health workers will present their knowledge and experience of traditional and western medicine to the students), Township offices, Grocery store (Bashas), and known Herbalists within the area are other resources students will use to gather information and use for their projects. Students will complete their project and will present them and display them in the school libraries. A requirement of a project is to create a presentation on a scientific method inquiry and enter the Navajo Nation science fair at the Navajo Nation capital in Window Rock.

Objective

Students will learn how plant herbs are used for healing purposes. They will also learn how western medicine impacts their lives compared to traditional healing. Students will listen to cultural speakers present and share their knowledge of natural medicine and will create folders from the various presentations. Creating folders will help students retain their knowledge of natural herbal medicine. Students will analyze Western medicine and will understand how pills, creams, and liquids are used to heal the body as opposed to natural herbs. They will create diagrams of how pills, creams, and liquids enter the body to heal the infected areas. How herb plant and common aspirin travels into the body and analyzing plant and animal cells are important concepts students need to know when learning about medicines.

Students will present their folders and posters at local community facilities like the Indian Health Services, Senior Citizen Center, Chapter House and the Township to increase awareness and resources available to the local community and outlying community members who come to Kayenta for health care, shopping, meetings, and their child's school.

Strategies

The unit will use numerous strategies that will help students learn how use some of the concepts like the T-graph, process grid, and text-n-you are a few. The unit will begin with an exploration of charts, inquiry T-chart and the big books. These strategies are anticipatory strategies which activate prior knowledge, focus on building background information, spark interest, and set student purpose for learning. This section is a good indicator to tell whether students know the topic or not.

The input strategies consist of pictorial charts, narrative input charts, poetry frames connecting vocabulary and content. It is the direct teaching of skills, an active participation using graphic organizers, patterning, visuals, and real items (realia). It will address the Green River and Colorado Plateau map of the land formation, climate zones with vegetation production according to the average seasonal weather productivity. Another pictorial chart will have a comparative map of Traditional and Western medicine of specific herbs to pills, creams, and liquids. Additional charts will focus on specific herbs and other western medications. The narrative input will contain a personal narrative of Navajo doctors working within the Reservation hospitals. The poetry frames will include academic vocabulary, content concepts, and poetry concepts.

The input strategies will consist of visual sketches and pictures with content information that students will incorporate with their board and folder projects. The next process is the guided oral practice strategies, consisting of students demonstrating their learning from the input strategies. It is an academic discourse of how students will negotiate for meaning, interact with text, process information, use meta-cognition, build self-esteem, and use their native language to support their understanding. The T-graph for social skills will address their conduct of Dine Philosophy of Education. The sentence patterning chart, the Here There poetry frame, expert groups, cooperative group charts, the English Language Development frame are some of the strategies implemented to guide student learning. The sentence patterning chart will address the part of speech within the SPC, trading game, flip charts and the Here There poetry frame. The expert groups strategies focus on specific topics.

Reading and Writing strategies consist of a print rich language functional environment, using a variety of text, media, modeling, interactive and oral activities, cooperative and individual accountability, scaffolding information. Strategies like cooperative strip paragraph for guided reading and writing, story map, shared reading and retelling, poetry, Writer's Workshop, Text & You, and level reading (clunkers and links). Closure, assessments and evaluation is when students use meta-cognition, explore and use their personal learning for individual learning of poetry, writing, projects, and completing assessments.

Activities

Students will collect herbs with the help of family members. They will create a plant booklet as a reference guide for the families to refer to when using herbs.

Students will create a first aid kit containing emergency items. A tackle box or a small ice tote chest can be used for the items. Items like antibiotic creams, rubber gloves, scissors, bandages, flashlight, batteries, gauzes, tweezers, and a square sheet for a sling, aspirin, and others.

Students will create a model of a plant and animal cell using baggy bags, corn syrup, buttons, various noodle shape, small bouncy ball, various color strings, cereal (fruit loops or cheerios), and colored marshmallows.

Students will view plant and animal cells on a slide through microscopes and will sketch and label parts of the

cells using the inquiry process.

Appendix-Content Standards

The Arizona State Standards and the Common Core Standards will be addressed in the curriculum, they include the following:

Strand 1: Inquiry Process is the basis for students to learn science. They will use the scientific Inquiry Process of questioning, planning and conducting investigation, using appropriate tools, and techniques to gather data. Students will use critical thinking skills, think logically about relationships while finding and using evidence, writing explanations and communicating results.

Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Strand 2: History and Nature of Science emphasizes the importance of including historical perspectives and the advances of new development bring to technology and human knowledge. It focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Strand 3: Science in Personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. It affords students the opportunity to understand their place in the world - as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Endnotes

¹ Hausman, "Meditations with the Navajo," 84

² Davies, "Healing Ways, Navajo Health Care in the Twentieth Century." 18

³ *ibid*, 19.

⁴ *ibid* 19.

⁵ *ibid* 189.

⁶ Arizona Chapter Committee, "Landscaping with Native Arizona Plants," 10.

7 ibid 10.

8 ibid 13.

9 ibid 13.

10 ibid 13.

11 ibid 16.

12 ibid 25.

13 ibid 25.

14 ibid plants.usda.gov USDA, Natural Resources Conservation Services

15 ibid plants.usda.gov

16 ibid plants.usda.gov

17 ibid plants.usda.gov

18 ibid plants.usda.gov

19 ibid plants.usda.gov

20 ibid plants.usda.gov

21 ibid plants.usda.gov

22 ibid plants.usda.gov

23 ibid plants.usda.gov

24 ibid plants.usda.gov

25 ibid Wagman, "The New Complete Medical and Health Encyclopedia V4" 1067

27 ibid 1068

28 ibid Wagman, "The New Complete Medical and Health Encyclopedia V1" 190

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