

INDIGENOUS KNOWLEDGE & EPIGENETICS

THUNDERBIRD PARTNERSHIP FOUNDATION

AFN MENTAL WELLNESS FORUM 2019





INDIGENOUS WELLNESS

*KNOWLEDGE
SPIRIT & DNA
LINKING CULTURE AND
EPIGENETICS*



RESEARCH & TRAINING

- *THE GOAL IS TO RESEARCH AND BUILD A TRAINING PROGRAM IN EPIGENETICS THAT WILL PROVIDE AN UNDERSTANDING OF EPIGENETICS AND ALSO MOTIVATE FURTHER EPIGENETICS RESEARCH RELATIVE TO THE INDIGENOUS EXPERIENCE. THE TRAINING PROGRAM WILL BRING TOGETHER INDIGENOUS AND WESTERN SCIENCE TO EMPOWER INDIGENOUS PEOPLE WITH AN UNDERSTANDING THAT WHILE THE ENVIRONMENT AND LIFE EXPERIENCE CAN SUPPRESS OR ALTER THE EXPRESSION OF THE INHERENT GIFTS OF THE CREATOR CARRIED IN OUR DNA, IT'S ALSO POSSIBLE TO REVERSE OR SHIFT THESE CHANGES TO A STATE OF WELLNESS THROUGH INDIGENOUS CULTURE*



Epigenetics

The Links Between Indigenous Knowledges and the Study of Epigenetics:

Epigenetics is primarily the study of changes within DNA structure, as a result of some external stimuli, which can be passed down from generation to generation.

Epigenetic alterations to DNA structure in turn result in changes in gene expression of the gene within that particular segment of DNA.

The story of Creation, the Creation of Human Being and the Journey of the spirit across the life span are all teachings rich with indigenous science that can be aligned with western science to build an understanding of how we might support First Nations people through our community programs and services

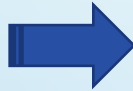
FOUNDATION

- *INDIGENOUS ORIGIN STORIES RETAIN THE MEMORY OF CREATION TIME AND THE KNOWLEDGE INHERENT WITHIN THEM IS CRITICAL IN UNDERSTANDING HOW TO PURSUE AND CREATE THE OPPORTUNITIES FOR 'HEALING AND WELLNESS'. ONE EXAMPLE IS THE ANISHINABE CREATION STORY REFERENCING THE 'STRINGING TOGETHER OF THE SEEDS OF LIFE' THAT SPEAKS TO THE GENETIC CODE. THE AUTHENTICITY OF INDIGENOUS SACRED KNOWLEDGE IS IN THE ABILITY TO IDENTIFY ORIGIN AND SOURCE.*

KNOWLEDGE GATHERING & RESEARCH

Elders and Knowledge Keepers from the Nations
across Turtle Island

Ojibway; sylix Okanagan; Wenatchi/ Lakes;
Sto:Lo; Cree; Mohawk; Mik'maw; Pikani; blackfoot;



Indigenous & Western Science

WE HAVE TO RESTORE THE PRIMARY PLACE OF SPIRIT IN THE WAY WE DO SCIENCE

KNOWLEDGE ALWAYS HAS BE TO TETHERED TO ITS ORIGIN.

WESTERN KNOWLEDGE

- THEORETICAL UNTIL IT'S PROVEN
- OWNERSHIP / AUTHORSHIP OF KNOWLEDGE
- PUBLIC KNOWLEDGE
- OPEN TO TESTING TO DETERMINE VALIDITY
- CITATION

SACRED KNOWLEDGE

- ORIGINAL KNOWLEDGE GIVEN BY THE SPIRIT
- CARRIED BY THE STUDENT / TEACHERS FOR THE PEOPLE
- HELD IN TRUST
- TRANSLATED ACROSS GENERATIONS TO MAKE USABLE IN ALL CONTEXTS WHILE MAINTAINING THE TRUTH OF THE KNOWLEDGE
- CITATION – SACRED SOCIETY / TEACHERS



RESEARCH/TRAINING
FOCUS & PURPOSE

The importance of knowing and understanding our past; knowing our family; community stories is critical to our identity and empowerment. The significance of our strength as a people is empowering. *'There is nothing inherently wrong with us.'*

*We want to teach people there is
HOPE*

*to support the state of our people
today; to support the future*

*Through an ethical translation process
engage FN communities in a
conversation about how it is possible to
reverse impacts of intergenerational
trauma into a collective state of
wellness through cultural practices.*



KNOWLEDGE GATHERING & RESEARCH

Our approach- we need to start from the Indigenous worldview first; our own knowledge base; gathering Indigenous Sacred Knowledge from across the country through capturing a common understanding (not actually telling the story), ensuring respect for and protection of our Sacred knowledge. It is about our own system of validation; and translation and sharing of knowledge.

Academic Research- Conduct an extensive Literature Review; Dr. Amy Bombay; Aaron Prosper (graduate student)



METHODOLOGY

- CULTURE-BASED PROCESS
- TWO-EYED SEEING- WORKING TOGETHER, COLLECTIVE ENERGY; PUTTING OUR MINDS TOGETHER TO CREATE GOOD HUMANITY
- IN TALKING ABOUT SACRED IDEAS, WE ARE REQUIRED TO UPHOLD THE INTEGRITY OF THE KNOWLEDGE ITSELF; TO THE SPIRIT; TO OUR ANCESTORS AND TO BE CAUTIOUS
- KNOWLEDGE TRANSLATION; MAKING THE LINKS BETWEEN CREATION STORIES; ABSOLUTE LAW; AND THE THEMES OF INDIGENOUS INTELLIGENCE/ INDIGENOUS ORGANIZATION
- ENSURING ELDERS ARE PRESENT THROUGHOUT THE TRAINING PROCESS



METHODOLOGY

- TRAINING HAS TO HAVE AN IMMEDIATE BENEFIT TO COMMUNITIES (TO WHAT PEOPLE WHO ARE PARTICIPATING IN THE EPIGENETICS TRAINING ARE INVOLVED IN)
- KNOWLEDGE TRANSLATION WITH VERSUS KNOWLEDGE TRANSLATION FOR
- EXPERIENTIAL KNOWLEDGE THAT ALLOWS A COLLECTIVE REVIEW OF THEIR EXPERIENCES WITH THE EPIGENETICS TRAINING IN PRACTICE. (INDIGENOUS WORLDVIEW IS THAT IT IS THE BELIEF IN THE SPIRIT FIRST; INFORMING THAT CHANGE IS FOREVER POSSIBLE IN THE RIGHT ENVIRONMENT; SO WHAT IS THE ENVIRONMENT THAT SUPPORTS THIS SHIFT

BLOOD MEMORY



- INDIGENOUS ELDERS OFTEN SAY THAT MEMORY IS IN THE BLOOD AND BONE, THAT OUR STORIES ARE PASSED NOT JUST VERBALLY BUT THROUGH A KIND OF GENETIC MEMORY.
- "WE NOW KNOW THAT EXPERIENCES AND THE ENVIRONMENT CAN TURN ON OR OFF GENES, SO THE FUNCTION OF THOSE GENES IS CHANGED," BOMBAY EXPLAINED. "IN TERMS OF HOW THAT IS TRANSMITTED GENERATIONALLY, WE KNOW THAT IF THOSE CHANGES HAPPEN TO BE IN THE GERM LINE, SO IN THE EGG OR THE SPERM, THEY HAVE THE POTENTIAL TO BE TRANSMITTED ACROSS GENERATIONS." AMY BOMBAY





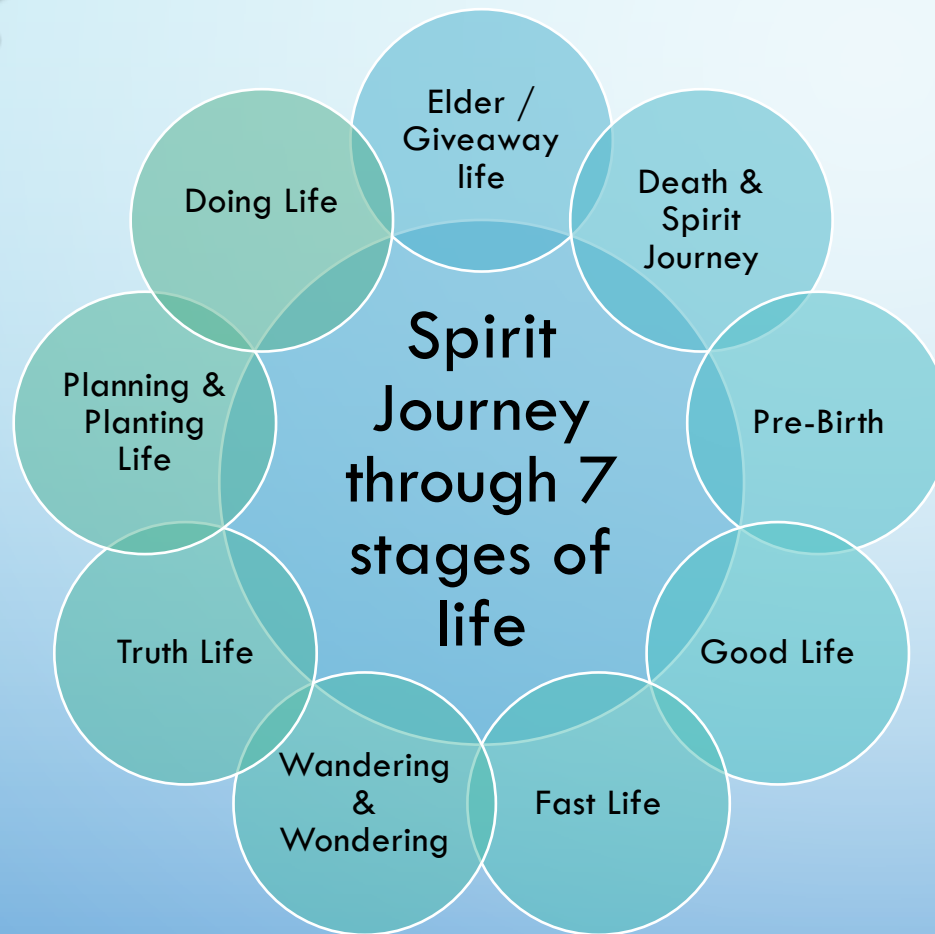
REFLECTIONS

- WHAT IS THE CONNECTION WITH WATER AND BLOOD MEMORY?

The background is a light blue gradient with several realistic water droplets of various sizes scattered across the surface. The droplets have highlights and shadows, giving them a three-dimensional appearance.

***“HOW ARE WE GOING TO DRESS OUR CHILDREN”
7 STAGES OF LIFE
ELDER PETER OCHIESE***

Story of Origin, Story of Creation of Human Beings....



**HOPE, BELONGING,
MEANING, &
PURPOSE ACROSS
THE STAGES OF LIFE
WITH CULTURE**

(PETER OCHIESE, AKI WININI)



**HOPE, BELONGING,
MEANING, & PURPOSE
ACROSS THE
STAGES OF LIFE
WITHOUT CULTURE**

**(PETER OCHIESE, AKI
WININI)**

BEHAVIOURAL EPIGENETIC FACTORS

FACTORS EFFECTS EPIGENOME

- PRE-NATAL AND POST-NATAL
NEGLECT OR ABUSE
- EARLY MOTHER-CHILD SEPARATION
(NEUROSCIENCE AND BIOBEHAVIORAL REVIEWS 33
(2009) 593–600)

INDIGENOUS EXPERIENCES

- LACK OF PRE- & POST-NATAL CARE
EDUCATION FOR FN MOTHERS &
IRS
- IRS & CURRENT CHILDWELFARE
SYSTEM



ACE'S AND EPIGENETICS

- ADVERSE CHILDHOOD EXPERIENCES:
([HTTPS://WWW.CDC.GOV/VIOLENCEPREVENTION/ACESTUDY/](https://www.cdc.gov/violenceprevention/ACESTUDY/))
 - EMOTIONAL ABUSE
 - PHYSICAL ABUSE
 - SEXUAL ABUSE
 - EMOTIONAL NEGLECT
 - PHYSICAL NEGLECT
 - MOTHER TREATED VIOLENTLY
 - HOUSEHOLD SUBSTANCE ABUSE
 - HOUSEHOLD MENTAL ILLNESS
 - PARENTAL SEPARATION OR DIVORCE
 - INCARCERATED HOUSEHOLD MEMBER



BEHAVIOURAL EPIGENETIC FACTORS

- EPIGENETIC VULNERABILITY TO DEPRESSION AND SUICIDE AS A RESULT OF ADVERSE CHILDHOOD EXPERIENCE'S (ACE'S)
- HIGH RATES OF FIRST NATIONS YOUTH SUICIDE MAY BE EXPLAINED THROUGH THIS REALM.
- AN INDIGENOUS UNDERSTANDING THAT THERE IS A DYNAMIC INTERDEPENDENCE BETWEEN OUR SPIRITUAL AND PHYSICAL WORLDS.
- A WESTERN UNDERSTANDING THAT THERE IS A DYNAMIC INTERDEPENDENCE BETWEEN OUR GENES AND THE ENVIRONMENTS IN WHICH WE LIVE.

BEHAVIOURAL EPIGENETIC FACTORS

- POOR SOCIAL ENVIRONMENTS FOSTER POOR EPIGENETIC OUTCOMES, VICE VERSA.
- MEMORY FORMATION AND CONSOLIDATION (J NEUROENDOCRINOL. 2013 NOV; 25(11): 1151–1162)
- THE LIVED HISTORICAL EXPERIENCES OF FN'S BY COLONIAL DESIGN HAS BEEN THAT OF A POOR SOCIAL ENVIRONMENT.
- IS THIS AN ISSUE AMONGST INDIGENOUS PEOPLES?



BEHAVIOURAL EPIGENETIC FACTORS

- OTHER AREAS OF BEHAVIOURAL EPIGENETICS STUDY COMMONLY INCLUDE (BUT IS NOT LIMITED TO):
 - NEUROBIOLOGY OF PSYCHOSIS (NOT LIMITED TO DRUG INDUCED PSYCHOSIS)
 - SCHIZOPHRENIA
 - BIPOLAR DISORDER
 - GENETIC BEHAVIOURAL DISORDERS LINK TO THE X-CHROMOSOME
 - DRUG ADDICTIONS
 - EPIGENETIC REGULATION OF OBESITY

**EPIGENETICS
TRAINING/EDUCATION/RESEARCH:
POTENTIAL SHORT AND LONG-TERM
BENEFITS**

- SHORT TERM – PERSONALIZED HEALTHCARE; PERSONAL UNDERSTANDING INTO ONE’S OWN ISSUES
- LONG TERM – THE POTENTIAL HEALTH CARE IMPROVEMENTS FOR FUTURE GENERATIONS; IMPROVED SOCIAL POLICY THAT EPIGENETICS CAN PINPOINT; IMPROVED FN’S RESEARCH ACROSS ALL DISCIPLINES

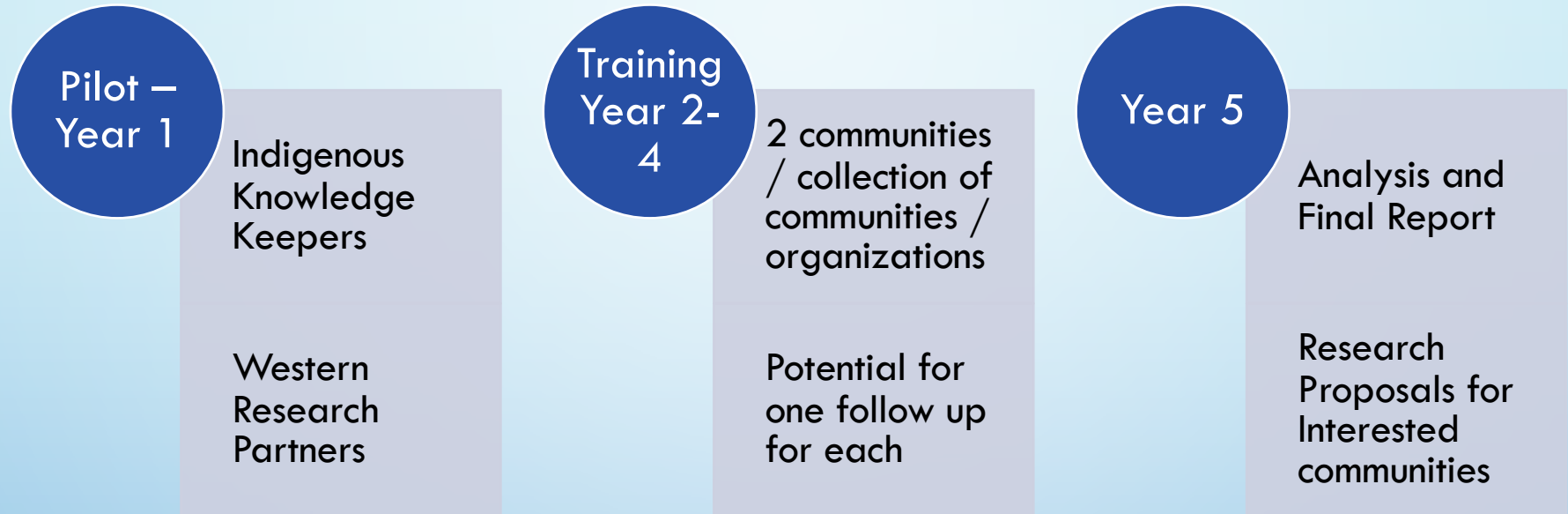


Training Outline & Methods

(2 communities/organizations per year with potential for one follow up training session for each)

FNMWC Continuum Framework sets foundation for the training: Hope, Belonging Meaning & Purpose; life span; understanding needs of population; essential basket of services; social determinants of health

Indigenous Science	Western Science	Method
	Genetics, Epigenetics, Microbiom	online introduction prior to f2f training
Creation – based on discussion with Elders (the source of potential)	Genetics (the potential)	Overview f2f – discussion of specific research questions
Creation of Human Being – based on discussion with Elders (4 levels of being, spirt seeds, identity, transmission from generation to generation)	Genetics / Epigenetics (DNA and environmental impacts on DNA Expression, transmission from generation to generation)	F2F training – discussion of specific research questions
Life Path – culturally defined developmental milestones across life path, blood memory, 7 generations	Epigenetics / Microbiom – relationship between person and environment, intergenerational transmission	F2F training – specific focus on population of interest to community, linking to Hope, Belonging, Meaning & Purpose



Communities / organizations can choose to take the 2 day training and finish or proceed to a 2nd follow up session, and or choose to proceed with research proposal for biomarker/physiological health research

LITERATURE REVIEW: BIOMARKER/ PHYSIOLOGICAL HEALTH RESEARCH

- **ETHICAL ISSUES AND BARRIERS AND SOLUTIONS TO BIOMARKER HEALTH RESEARCH WITH INDIGENOUS POPULATIONS**
- IT IS CLEAR THAT THESE OBSTACLES THAT WERE THE NORM IN THE PAST ARE DECREASING AS MORE FIRST NATIONS INDIVIDUALS ARE BECOMING RESEARCHERS, AND AS FIRST NATIONS COMMUNITIES AND ORGANIZATIONS IMPROVE THEIR CAPACITY WITH RESPECT TO RESEARCH ETHICS AND METHODS
- THE AFN HAS ALREADY CARRIED OUT RESEARCH PROJECTS THAT INVOLVED THE COLLECTION OF BIOMARKER RESEARCH THAT WAS CARRIED WITHIN THE FIRST NATIONS PRINCIPLES OF OWNERSHIP, CONTROL, ACCESS, AND POSSESSION (OCAP).
 - IN THIS EXAMPLE, AFN ACTED AS CUSTODIAN FOR THE RESULTING DATA, WHILE THE FIRST NATION COMMUNITIES THAT PARTICIPATED IN THE STUDY OWNED THEIR OWN DATA AND CONTROLLED THE FUTURE USE, DISSEMINATION SEND TRANSFER OF DATA.
- BIOBANKS ESTABLISHED IN US, AUSTRALIA, NEW ZEALAND

SUGGESTIONS FOR ETHICAL GENETIC AND EPIGENETIC RESEARCH WITH INDIGENOUS POPULATIONS

- THE CREATION OF BIOSPECIMEN COLLECTIONS UNDER ROBUST INDIGENOUS GOVERNANCE IS ONE WAY TO ADDRESS MANY ETHICAL CONCERNS
- A PROMINENT EXAMPLE IS THE ALASKAN AREA SPECIMEN BANK, A RESOURCE OF OVER 500 000 BIOSPECIMENS OF WHICH 76% WERE COLLECTED FROM NATIVE ALASKANS. THE COLLECTION IS GOVERNED BY THE ALASKA AREA SPECIMEN BANK WORKING GROUP, A BODY THAT INCLUDES REPRESENTATIVES FROM ALASKAN NATIVE TRIBAL HEALTH ORGANIZATIONS AND THE INDIAN HEALTH SERVICE. ALL PROJECTS THAT SEEK TO ACCESS THE BANK NEED APPROVAL FROM A TRIBAL HEALTH ORGANIZATION, AND ALSO REQUIRE INDIVIDUAL CONSENT IF IDENTIFYING INFORMATION IS TO BE USED (PARKINSON ET AL., 2013)
- ANOTHER NEWLY ESTABLISHED COLLECTION OF INDIGENOUS BIOSPECIMENS UNDER INDIGENOUS GOVERNANCE IS THE NATIONAL CENTRE FOR INDIGENOUS GENOMICS AT THE AUSTRALIAN NATIONAL UNIVERSITY



SUGGESTIONS FOR ETHICAL GENETIC AND EPIGENETIC RESEARCH WITH INDIGENOUS POPULATIONS

- TOOLS TO EDUCATE AND EMPOWER INDIGENOUS PEOPLE TO TAKE AN ACTIVE ROLE IN GENETIC RESEARCH PROJECTS
- THE AMERICAN INDIAN AND ALASKAN NATIVE GENETICS RESOURCE CENTER IS A WEB SITE DEVELOPED BY THE NATIONAL CONGRESS OF AMERICAN INDIANS TO PROVIDE RESOURCES FOR TRIBES WHO ARE CONSIDERING PARTICIPATING IN GENETIC RESEARCH OR DEVELOPING THEIR OWN RESEARCH PROJECTS (AMERICAN INDIAN AND ALASKA NATIVE GENETICS RESOURCE CENTER)
- SUMMER INSTITUTE FOR NATIVE AMERICANS IN GENOMICS, HOSTED ANNUALLY AT THE UNIVERSITY OF ILLINOIS SINCE 2011 AND OPEN TO INDIGENOUS PEOPLE FROM ACROSS THE AMERICAS (THE INSTITUTE FOR GENOMIC BIOLOGY).
 - **IT AIMS TO INTRODUCE PARTICIPANTS TO THE PRINCIPLES AND PRACTICES OF GENOMICS AND INFORMATICS;**
 - **FACILITATE DISCUSSION OF BIOETHICS IN INDIGENOUS GENETIC RESEARCH;**
 - **AND PROMOTE SCIENCE CAREERS FOR INDIGENOUS PEOPLE**



A dark blue vertical banner with white text and bubble graphics. The text reads "DAKOTA" in a large, bold, sans-serif font, followed by "38 + 2" in a slightly smaller font. Several white, semi-transparent bubbles of various sizes are scattered across the banner, some overlapping the text.

DAKOTA

38 + 2

- MANKATO, MINNESOTA ON DEC. 26TH, 1863, 38 DAKOTA MEN HANGED ALONG WITH TWO OTHERS THROUGHOUT THAT NEXT YEAR.
- THE LARGEST MASS EXECUTION EVER CARRIED OUT BY AN AMERICAN GOVERNMENT. WITH 300 ORIGINALLY MEANT TO BE HANGED
- DOCUMENTARY ABOUT DAKOTA VETERAN AND ELDER JIM MILLER AND HIS DREAM TO HONOUR THE 40 DAKOTA MEN KILLED IN 1863/64.

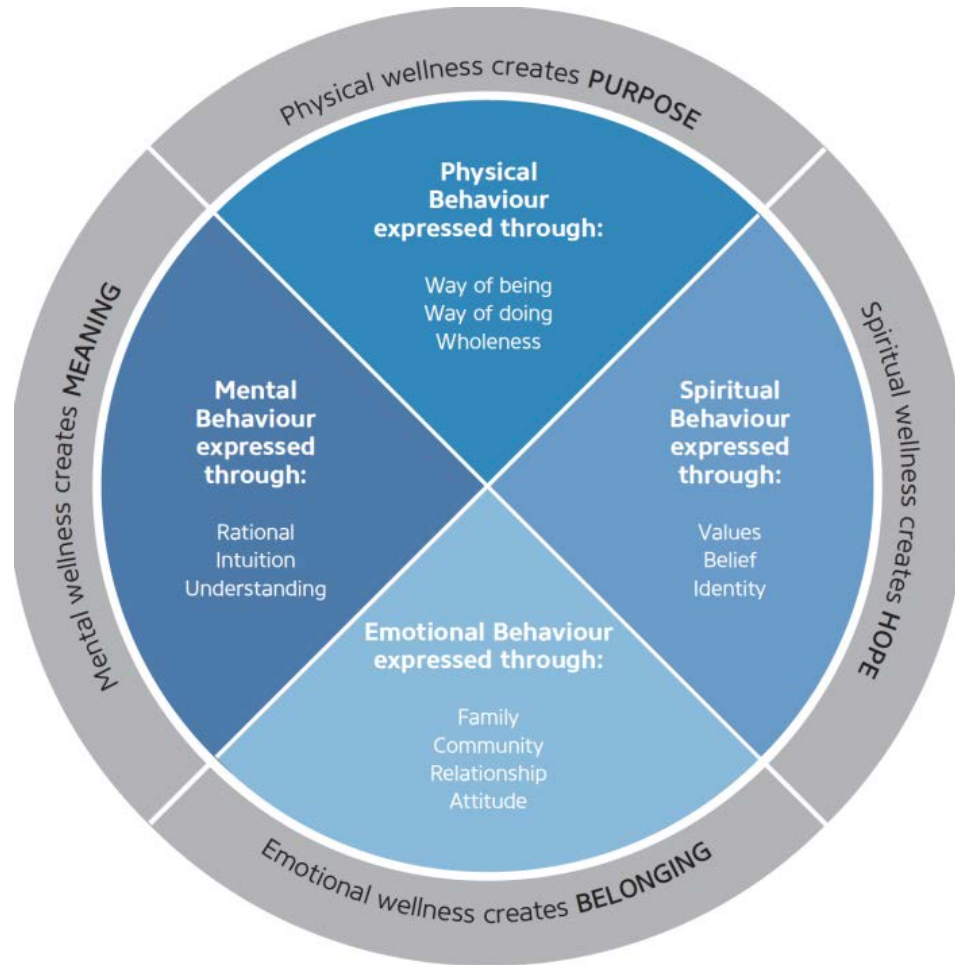


DAKOTA

38 + 2

- “OUR PEOPLE SUFFER FROM SOMETHING. AN ELDERLY WOMEN, A FULL BLOOD LAKOTA FROM COCREE WHERE I’M FROM. I WAS WITH HER ONE TIME AND A LOT OF BAD THINGS WERE GOING ON. I’D ASKED HER, WHY DOES THIS ALWAYS HAPPEN TO US, WHY DO WE ALWAYS DO THIS TO EACH OTHER. SHE DIDN’T SAY ANYTHING FOR A WHILE, WE WERE DRIVING. AND WHEN I LOOKED OVER SHE WAS CRYING. SHE SAID IN OUR LANGUAGE ‘IOKE SHETA’, A DEEP EMBEDDED GENETIC DEPRESSION.” OUR PEOPLE AT ONE TIME HAD A VERY STRONG CONNECTION WITH MOTHER EARTH, THE CREATOR, NATURE, AND ALL OF IT WAS TAKEN AWAY JUST LIKE THAT. A LOT OF THIS DEPRESSION STEMS FROM OUR LOSS OF THIS CONNECTION WITH EVERYTHING THAT WE ONCE HAD. A LOT OF OUR PEOPLE ARE DEPRESSED AND WE DON’T EVEN KNOW IT.”





MEEGWETCH

- **MARY DELEARY**
- **THUNDERBIRD PARTNERSHIP FOUNDATION**
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