

# Native Oral Health

Terry Batliner, DDS, MBA



# American Indians

- 566 federally recognized tribes
- 5.2 million people
- 2% of population
- 325 reservations
- 22% of AI live on tribal lands
- Median age 30.8 compared to 37.5 for all US

# American Indians - Disparities

## Residents Below Poverty Level

- 29.2 %
- Some reservations as high as 52%

## Unemployment

- 13 to 80%
- 7 of 10 poorest counties in US are Indian reservations

## Healthcare spending

- Less than VA or BOP

# American Indians - Disparities

Compared to the US Population:

Life expectancy is  
5 years less

**Untreated Dental  
Caries in children  
5 times higher**

Maternal Death  
Rates 2.4 times  
higher

Diabetes  
mortality is 2.9  
times higher

Infant mortality  
rate is 20%  
higher

# Health Care

- Indian Health Service
  - Directly provides care
  - Purchases some care for people living on and near reservations
- Tribal programs
  - Tribes can assume the management of their health care systems
  - Use federal money and sometimes tribal money

# Urban Indians

- The majority of Native people live in cities
- May get care from urban Indian clinics – Funding and therefore services are limited
- Approximately 30,000 people in Denver – a small, underfunded clinic exists near City Park
- Some urban clinics have become FQHCs – serving AI, AN and others

# Money Is Tight

- IHS has to live within a budget
- Rationing is an everyday occurrence
- Cost is important
- Dental care is underfunded



# Example

Pine Ridge South Dakota

- Call on Monday
- Appointments fill up quickly
- Show up and wait for someone to not show up
- Emergencies show up and wait

# Example

- 7 - 9 dentists working in three clinics in an area the size of Connecticut
- 35,000 population
- US average dentist to population ratio is 1:1,600
- IHS 1:3,800 and worse
- Large area, high prevalence and severity of disease and few dental providers

# American Indians

- Some do not go to the dentist because they do not feel welcome.
- Get mixed messages:
  - Why didn't you come sooner?
  - Why are you here – other people have bigger problems than you?

# American Indians

Accepted facts:

- Teeth get decayed in children
- Adults loose teeth
- You go to a dentist when you have pain or an infection
- Dentists are from other locations and ethnicities

# American Indians

- Nationwide – 50% of native preschool kids have untreated decay
- Adults – 72% to 97% have untreated decay
- Pine Ridge – 84% (kids) and 97% (adults)
- Santo Domingo Pueblo – 48% (K) and 72% (A)
- Navajo – 70% of Head Start kids have untreated decay

# Legal Status of Tribes

- Tribes outside of Alaska are organized into tribal governments
- Most have structure similar to federal government with an executive branch (Tribal President or Principal Chief), legislative branch (Tribal Council or Trustees), and judicial branch (Tribal courts) – Felonies handled in Federal court
- Sovereign immunity – Similar to states



Center for  
Native  
Oral Health  
Research



What are we doing?

# Mission

To work with AI/AN communities to conduct, facilitate, and disseminate the next generation of AI/AN oral health intervention research.

# The Center for Native Oral Health Research (CNOHR)

- One of 3 Collaborating Centers for Early Childhood Caries funded by the National Institute of Dental and Craniofacial Research (NIDCR)
  - CU - American Indians and Alaska Native (AI/AN)
  - Boston University – Inner city housing
  - University of California at San Francisco – Hispanic

# Current Research Studies

- Two culturally-sensitive RCTs of behavioral interventions
- One developmental project
- Community-based participatory research methodologies

# Working With The Community

- Tribal government
  - tribal health boards
  - tribal research review boards
- Recruit at women's clinics, hospitals, immunization clinics, daycare centers, and schools
- Staff participates in health fairs, powwows, cultural & social events to engage the community

# Interaction with Community



# Community's Contribution to Research

- Center Advisory Committee
  - Advises about present and future projects
- Community Advisory Board (CAB)
  - Shapes project on their reservation
- Key study staff
  - Native people working at home

# Strategies Developed in Partnership

- Use of native language and native people on billboards and study material distributed to participants
- No ‘control groups’ – ‘enhanced community service group’ instead
- Community Oral Health Specialist approach in Navajo study
- Many more...

# Approvals

Protocol approvals were received

1. National Institute of Dental and Craniofacial Research (NIH/NIDCR)
2. University of Colorado Institutional Review Board (COMIRB)
3. Navajo Nation Human Research and Review Board
4. Oglala Sioux Research Review Board
5. Indian Health Service Area Office

# Outcomes

- Primary outcome
  - decayed, missing, and filled tooth surfaces in children (dmfs)
- Secondary outcomes
  - Caregivers oral health knowledge, attitudes, beliefs and behaviors
  - Caries patterns

Back, back, back and forth,  
brushing every one.  
From back to front and sides too,  
especially your tongue.  
Swish, swish, swish and spit,  
rise until you're through.  
Turn the water off right now,  
and see a spartly you!!!  
*Step to the back "Wash, Wash Your Feet"*



# Basic Research Factors Questionnaire (BRFQ)

- BRFQ collects data on a number of potential risk factors
  - Caregiver and household characteristics
  - Caregiver dental knowledge, attitudes, beliefs and behaviors
  - Caregiver contributing factors affecting utilization

# Caregiver and Household Characteristics

- Age
- Gender
- Highest grade attained
- Employment status
- Tribal affiliation
- Relationship to child
- Number of household members
- Annual household income
- Perceived adequacy of income

# Caregiver Knowledge, Attitudes, Beliefs and Behaviors

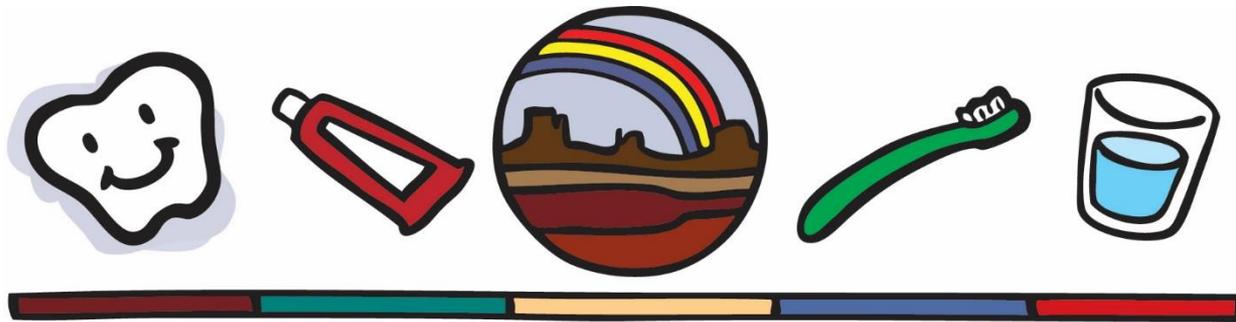
- Oral health behaviors
- Self-efficacy (confidence that one can engage in good oral health behavior)
- Perceived importance of good oral health behavior
- Locus of control regarding child's oral health
- Perceived benefits of and barriers to good oral health behavior
- Perceived seriousness of poor oral health outcomes for child
- Perceived susceptibility of child to poor oral health outcomes

# Caregiver Utilization

- Health literacy
- Comorbidities
- Parent's oral health status
- Alcohol use
- Distress
- Chronic stress
- Perceived discrimination
- Tribal identity
- Sense of coherence
- Social support
- Access to a working vehicle



# “Preventing Cavities in Preschoolers: Testing a Unique Service Delivery Model in American Indian Head Start Programs”



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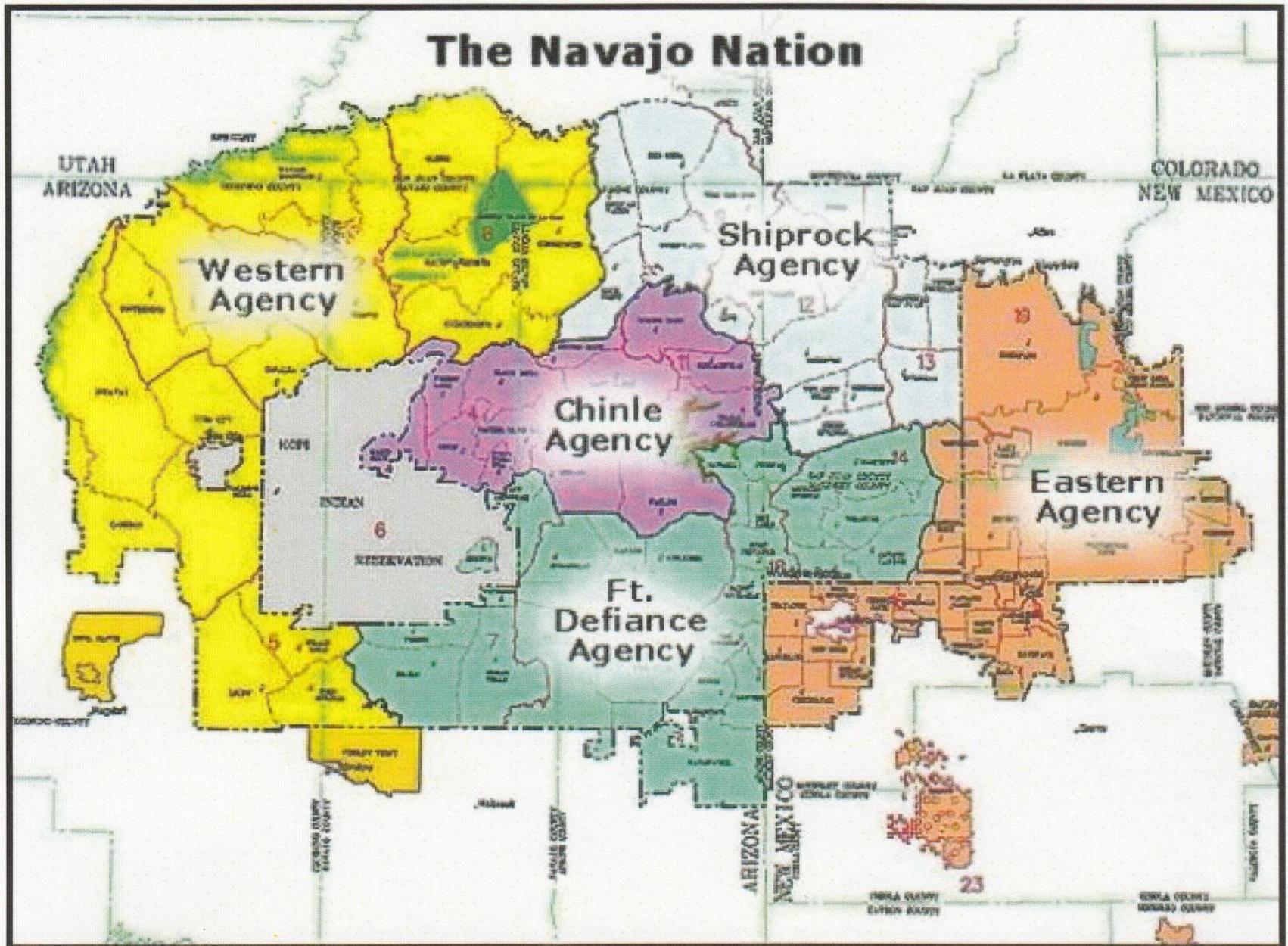
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# Navajo Nation



# The Navajo Nation



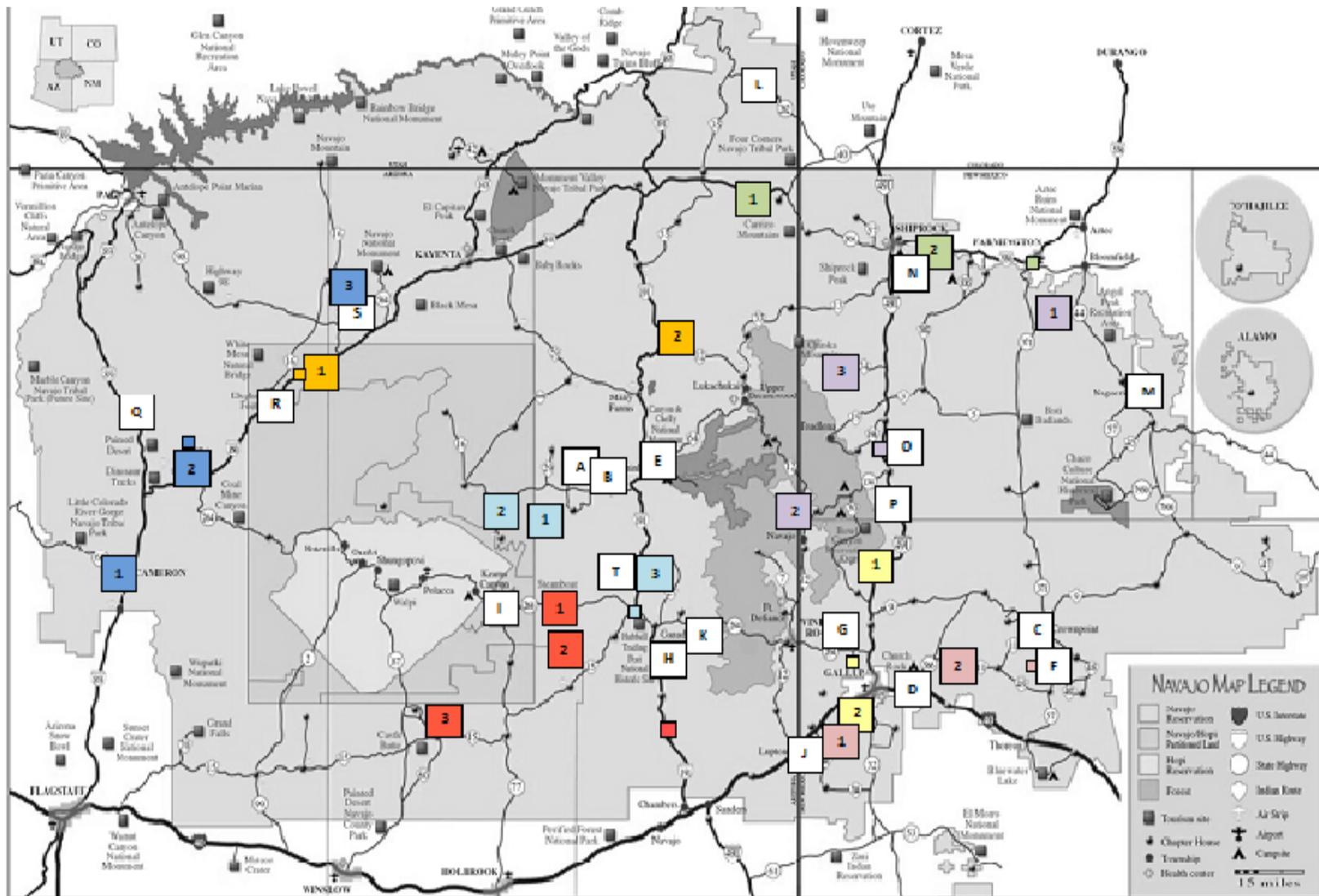


# Study Setting

## Navajo Head Start Centers

- Federal program-105 HS Centers
- Comprehensive child development program serving children ages 3-6 years and their families
- Community-based, child-focused program
- Overarching goal: increasing the social competence of young children in low-income families
- Head Start performance standards





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# Clustered Randomized Trial

**WHAT:** Cluster randomized trial of HS classrooms

**WHO:** Children ages 3-6 enrolled in Head Start

**HOW:** Community Oral Health Specialists (COHS)

**WHERE:** Head Start classroom

**WHEN:** Academic years 2011-12 and 2012-13



# Study Progress

**2010-11: Recruitment of 52 classrooms**

- 26 Intervention/26 Usual
- 1016 Caregiver-Child Dyads

**2011-12 and 2012-13 school years**

- Intervention completed May 9, 2013

**Measuring outcomes**

- Fall 2012 (Baseline assessment)
- Fall 2013 (Longitudinal data collection)
- Fall 2014 (Final data collection)

# Intervention Activities



**4 fluoride varnish applications across the school year**

## **#1: Parent Day/Program Kick-off (Parent and Child Activity)**

### **Parent/Caregiver activities**

- #2:** Tooth brushing & Importance of fluoride
- #3:** You can help prevent caries.
- #4:** Healthy Adult Teeth Start with Healthy Baby Teeth

-- All include **self-management goal-setting activity**

### **Child activities in classroom**

- #2:** Brushing for a Healthy Smile
- #3:** Our Teeth Do Not Like Sticky Foods–Nutrition
- #4:** Visiting the Dentist
- #5:** Fluoride is Our Friend



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## BASELINE DATA

# Baseline dmfs Data

## Overall

Mean dmfs: 21.33 (N = 981)

Mean dfs\* : 17.45

## Distribution by Age

Age 3: Mean = 18.09 (N = 398)

Age 4: Mean = 22.94 (N = 537)

Age 5: Mean = 39.04 (N = 23)

(US population ages 2-5: dfs\* = 2.58)

(Source: NHANES 1999-2004; dfs = decayed or filled surfaces, not missing)





Promoting Behavior Change for Oral Health in American Indian Mothers and Children





# Study Design

- Setting: On and Near Pine Ridge Reservation
- Sample: 600 Mothers and children (0 – 3 months)
- Recruitment: Completed January 2014
- Intervention: The use of motivational interviewing (MI) to encourage caries prevention behaviors in new mothers
- Timing: MI every 6 months x 4, Surveys and Dental Exams every year for 3 years

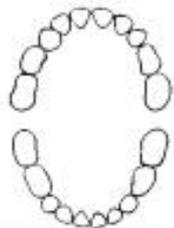
# Study Hypothesis

This study will determine whether an intervention of enhanced community services plus MI compared with enhanced community services alone in mothers/caregivers of AI newborns will reduce dmfs measures of the children at ages 1, 2, and 3 years.

# Pine Ridge Reservation



# Study Materials



**Tooth chart**  
Ages 2 - 3  
(Tooth growth may vary among children.)

Frequent or continuous exposure to refined and natural sugars in drinks, snacks and candy can lead to cavities.



Baby teeth are important for your child's chewing, speaking, jaw development, self-esteem, and protection of permanent teeth.



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Grant #1 U54 DE049239

A special thanks to our Community board and all others involved in development and approval.

**Contact Information**  
Phone: 805.842.1133  
LOCATION:  
University of Colorado Five Ridge Field office is located in the Wilson Center Building next door to 5000.

Okicya Iha  
To Help Others Smile



Ages 2-3




Help children brush their teeth until age six years, and then supervise them until age eight years. Young children are still developing coordination and may require your assistance to reach all surfaces (sides) of their teeth.




For young children with several teeth, use a small pea-size amount of fluoridated toothpaste on a soft toothbrush when you brush their teeth.



Your children learn by watching you. Show them that you value a healthy body and a healthy smile. Brush and floss your teeth daily.

Limit sweet drinks (juice and soda), sugary snacks, and junk food to special occasions.



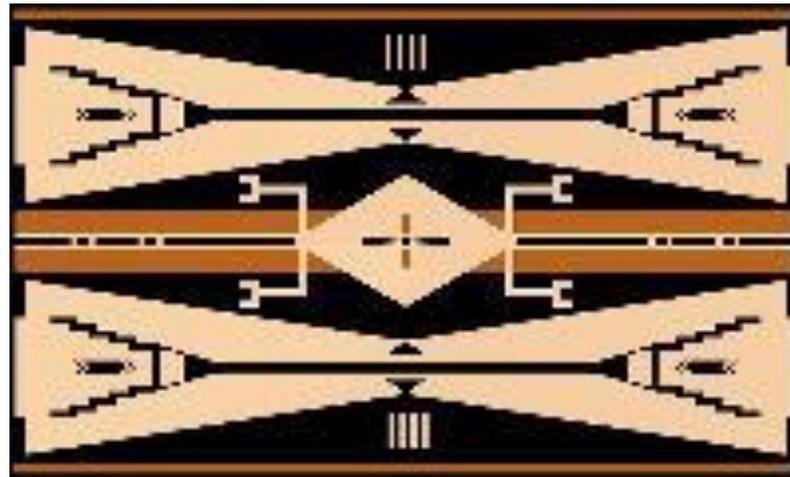
For snacks, good choices are fruit, vegetables, cheese, or yogurt.



# Research

- Research
  - Our PR study starts within 3 months of birth
  - Intervention is with the mother or care giver
  - Treatment is not needed because there is no decay at time = 0

# The GRINS Project



# Background

- Prevalence/severity of gingival inflammation and periodontal disease in American Indian/ Alaska Natives (AI/AN) youth has not well described.
- In AI/AN youth, there is an increased high risk for developing Type 2 Diabetes or obesity.
- Metabolic Syndrome (MS) characteristics increase the risk of T2D and cardiovascular disease (CVD), and studies demonstrate a link between T2D and increased risk of periodontal disease in adults.
- The presence of PD has been shown to be associated with CVD and diabetes complications in adults.

# Objectives

- Investigate the prevalence of periodontal disease in AI/AN adolescents
- Evaluate the relationship between cardiometabolic risk characteristics and periodontal disease
- Determine early risk markers of periodontal disease in AI/AN youth

# Participants (N=136)

Characteristics	Mean $\pm$ SE
Gender (M/F)	61/75
Age (years)	15.7 $\pm$ 0.2
Race/Ethnicity (AI/AN)	129/7
BMI (kg/m <sup>2</sup> )	25 $\pm$ 1
BMI Percentile	68 $\pm$ 3
Waist (cm)	87 $\pm$ 2
Hip (cm)	96 $\pm$ 1

# Cardio-metabolic abnormalities correlated with dental disease risk

MS Measures	DMFT (r-value)	p-value
BMI (kg/m <sup>2</sup> )	0.19	0.04*
BMI Percentile	0.18	0.05
Hip (cm)	0.18	0.06
Waist (cm)	0.18	0.06
DBP (mmHg)	0.24	0.01*
Triglycerides	0.22	0.02*

Mean ± SE; \* P<0.05

Dental Measures	DBP (r-value)	p-value
DMFS	0.21	0.02*
Calculus Index	0.23	0.02*
Bleeding on Probing	0.15	0.09

# Discussion

- Dental caries was associated with multiple Metabolic Syndrome components. 3 Of 5 - Obesity, High BP, High glucose, high triglycerides, low HDL
- CVD markers correlated with signs of gingivitis.



# Preventive Procedures

Provided by a dentist

- Prophylaxis – cleaning
- Fluoride applications
- Sealants
- Antibacterial rinses

Home care

- Brushing and flossing – other
- Rinses

# Diet

- Frequency is the most important issue
- Amount is less important from an oral health perspective
- What is eaten and when – sugar in late evening
- Bottles and sippy cups

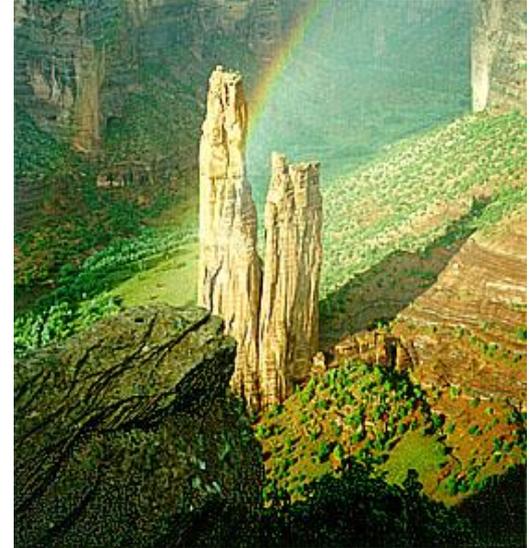
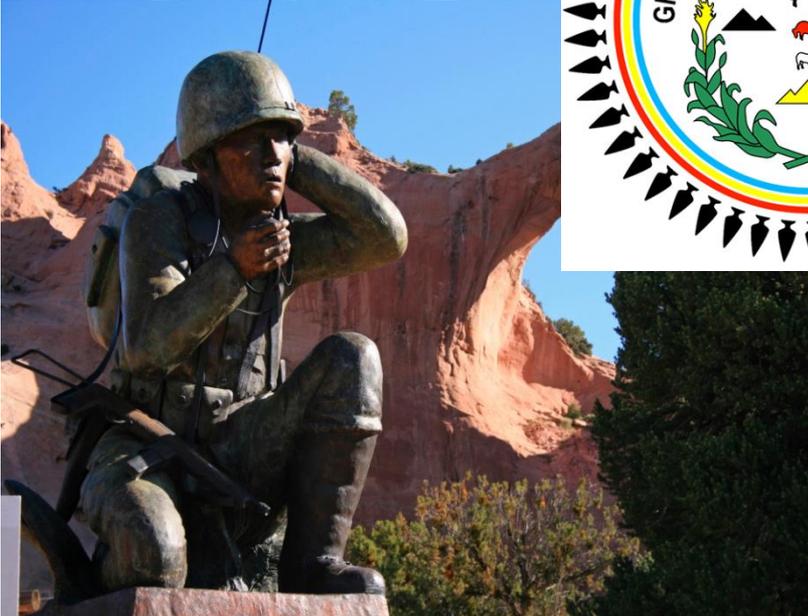
# So What Are We Learning?

- Oral disease is not that easy to prevent
- Education programs do not seem to change oral health behaviors
- Home care and diet are most important
- Fluoride varnish in people with significant existing caries is of minimal value and Fluoride will not override diet
- Diet and behaviors must be favorable early
- Restorative care must be provided

# How To Improve Oral Health

- Focus on methods that lead to changed behaviors – Motivational Interviewing?
- Ensure access to both restorative care and preventive care
- Diet and home care trump everything
- Care must be available for the entirety of life
- Not yet a magic solution

# Questions?



# Mythology of the Privileged

- Access to care – some people want it
- Care to access – a term used by the ADA and faculty members at some of the nations finest dental schools
  - Implies that people just don't care – oral health not on their priority list
  - Complete Fallacy - People want care and dentists have a responsibility to facilitate that care

# Case For Discussion

- You are a consultant to a tribe
- There are 6,000 people on the reservation
- The IHS runs a clinic with 2 dentists but they see patients equivalent to 1.5 FTE
- Oral health is poor – kids going to OR; adults with missing teeth; teens and twenties with infections and pain

# Case

- Dental clinic sees mostly emergencies – people in pain or with swelling
- Kids can get appointments – adults must walk in
- No dental hygienists employed – No 6 month visits
- Water not fluoridated

# The Tribe Takes Over

What should they do?

1. Staffing – dentists, hygienists and dental therapists?

2. Facilities

3. Water systems

4. Approaches – education?

5. Marketing – What is acceptable

# Ability to Change

- Money?
- Effective procedures?
- Available staff?
- Communication?
- Other concerns for community?

# Waste

- Prevention with no treatment in anyone with caries
- Education?
- FL varnish without treatment in high risk people