

# A Community-Clinical Partnership for Improving Diabetes Management and Outcomes for American Indians

Kathryn Langwell<sup>1</sup>, Catherine Keene<sup>2</sup>, Linda Chioma Ogu<sup>1</sup>, Matthew Zullo<sup>1</sup>

<sup>1</sup>Sundance Research Institute, Bethesda, MD, <sup>2</sup>Eastern Shoshone Tribal Health, Fort Washakie, WY

## Abstract

The age-adjusted prevalence of diabetes among American Indians and Alaska Natives served by the Indian Health Service is substantially higher than for other racial/ethnic groups in the U.S., at 16.1 percent of the adult population (NIDDK, 2011). Although there has been considerable attention to development of strategies and interventions to reduce diabetes risk factors in this population, there has been limited research on the effectiveness of these interventions. This paper describes the implementation, evolution, and outcomes of an interventional program designed and conducted by participating Tribes, in partnership with IHS clinicians, to improve diabetes management and outcomes for Tribal members with diagnosed diabetes or pre-diabetes. The interventions included development of culturally-tailored diabetes self-management education (DSME) programs, training of Tribal staff to deliver the DSME, followed by 16 weeks of additional physical activity based on the Group Lifestyle Balance™ program, and creation of a community-clinical partnership for referrals to the Tribal program and sharing of data and resources to support people with diabetes. Evaluation of the impact of the initial three years of the program indicate that DSME provided by lay health educators, combined with increased communication and support from Indian Health Service physicians, resulted in statistically significant increases in confidence in ability to manage diabetes, positive changes in self-reported eating patterns and physical activity levels, and improvements in perceptions of the support from the diabetes care team. Clinical outcomes were assessed using pre-intervention clinical data for 103 program participants who had provided HIPAA authorization for release of these data. Findings indicate that HbA1c levels declined for 46%, with a decrease in average HbA1c of 1.12 points. Participants with initial HbA1c levels above 12.0 achieved an average reduction of 3.0 points.

## Objectives

- Implement and evaluate a community-driven Chronic Care Model emphasizing coordination between Tribal leadership, lay health educators and IHS clinical providers
- Incorporate Tribal cultural components such as traditional foods, games and dances to the delivery of Diabetes Self-Management Education (DSME) and Group Lifestyle Balance™
- Identify and address unique barriers to healthy lifestyles faced by Tribal members with Diabetes who reside on reservations
- Develop an intervention that can delay or prevent diabetes onset and is replicable by other American Indian communities and their community partners

## Methods



**Figure 1. Combined Tribal Participatory Approach and Chronic Care Model.**

A unique aspect of this program is the community-led implementation of the Chronic Care Model (CCM). CCM has most often been initiated by clinicians to improve care coordination by linking patients with community resources. Our project was initiated by the Tribe and reached out to physicians and other community resource organizations to develop a strong coalition to address diabetes management and prevention. This included development of referral processes, sharing of data and information, and sharing of resources and information to increase community awareness of the benefits of lifestyle changes for prevention of diabetes.

**Program Design.** The Wind River Indian Reservation Alliance to Reduce Disparities in Diabetes (ARDD) program consisted of two components: 6 weekly sessions of DSME curriculum, followed by 12 weekly sessions of Group Lifestyle Balance™ physical activity and nutrition education. Recruitment utilized multiple strategies such as advertisement in Tribal and IHS offices, home visits to Tribal members listed in the IHS Diabetes Registry, and patient referrals by the IHS Diabetes Coordinator of both newly diagnosed diabetic patients and patients presenting with HbA1c > 9.0%. We present a sample of 103 participants who completed the program across years 2009 to 2011.

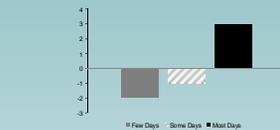
Sex (n)	
Male	21.3%
Female	61.1%
Age, yrs (mean +/- SD)	53.5 +/- 14.2
Highest Education Level, n (%)	
High School	45 (43.7%)
Post-Secondary	40 (38.8%)
Body Mass Index (BMI), kg/m <sup>2</sup> (mean +/- SD)	33.1 +/- 7.5
HbA1c, DCCT% (mean +/- SD)	8.4 +/- 2.4
Years Informed of Diabetic Status, median (IQR)	8.0 (2.0-13.0)
Past Diagnoses, n(%)	
Hypertension	54 (52.4%)
Hyperlipidemia	39 (37.9%)
Cigarette Smoker [self-reported], n(%)	30 (29.1%)
Has a Primary Care Physician, n (%)	62 (60.2%)
Past Year Participation in Diabetes Program, n(%)	24 (23.3%)
Receiving Regular Care for Diabetes, n(%)	70 (67.9%)

**Table 1. Eastern Shoshone and Northern Arapaho Tribe Participant Baseline Characteristics.** The majority of Wind River ARDD program participants were middle-aged adults 45 to 64 years of age (45.6%). Females outnumbered males across all age strata except ages 18 and under, in which 2 of 3 adolescents were male (66.7%). Five percent of participants were aged 75 years or older.

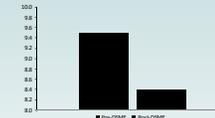
Only 10% of program participants were observed to have a BMI m 24.9 kg/m<sup>2</sup> at baseline. Nearly half (48.5%) of participants presented with BMI classified as 'Obese' (30-34.9 kg/m<sup>2</sup>) or 'Severely Obese' (35.0-39.9 kg/m<sup>2</sup>). The highest baseline BMI observed was 62.3 kg/m<sup>2</sup>. Female participants presented with significantly higher mean BMI (+4.6 kg/m<sup>2</sup>) than male participants (p=0.004).

Twenty-five percent of participants had been informed of their diabetic status within the 2 years preceding program entry, while 10% had been aware for 20 years or more. Forty-four percent of participants rated their health as 'Good'. Still, 37.9% of participants displayed HbA1c > 9.0%, most of whom were aged 25-64 years (71.8%).

## Results



**Figure 2. Relative Change in the Number of Days Participants Reported Eating Healthier Following DSME.** The proportion of tribal members who reported trying a healthier eating plan 5 to 7 days a week increased 14.3% following culturally-adapted DSME sessions (p=0.027).



**Figure 3. Decline in Participant HbA1c Readings Observed Following Culturally-Tailored DSME Sessions.** Tribal members experienced a marginally significant drop in mean HbA1c, from 9.5% (± 3.5) to 8.4% (± 2.2) (p=0.079)

By last session, Group Lifestyle Balance™ also promoted multiple positive health outcomes in Wind River ARDD participants:

- ✓ Reduction in mean systolic (-3.1 mmHg, p=0.012) and mean diastolic (-3.6 mmHg, p<0.001) blood pressure
- ✓ Median weight loss of 5lbs (p<0.001)
- ✓ Reduction in median blood glucose from 102.0 mg/dL to 97.0 mg/dL. (p=0.002)

\*\*Tests for significance were done at the 0.05 level. Survey questions examining attitudes, behaviors and health care experiences utilized a series of ordinal variables and 4- and 7- point Likert scales. Paired ordinal measurements were examined by Wilcoxon signed-rank tests, or dichotomized to compare favorable to unfavorable response frequencies by McNemar test. Paired clinical measurements such as HbA1c, blood pressure or blood glucose demonstrating normal distributions were examined by paired t-test, while paired clinical measurements demonstrating a skewed distribution were reported as median and interquartile range where appropriate. Data were analyzed using SAS® 9.4.

## Conclusions

This community-initiated Chronic Care Model has increased coordination of services and resources for management and prevention of diabetes on Wind River Indian Reservation. An active and effective Coalition for Chronic Disease Prevention and Management has been established, Tribal and IHS programs are now sharing data and referrals, and community awareness of the resources available has increased. Over 25% of Tribal members with diabetes have participated in the Wind River ARDD program, many of whom experienced positive clinical and behavioral outcomes by program end.

## Acknowledgements

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