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Evaluating the Impact of Medical Nutrition Therapy on Patient Outcomes Among Native Americans Newly Diagnosed with Type 2 Diabetes

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Introduction and Background

Medical nutrition therapy (MNT) is an essential component of successful diabetes care and management. Achieving nutrition-related goals requires a coordinated team effort that includes the person with diabetes. Because of the complexity of nutrition issues, it is recommended that a registered dietitian (RD) who is knowledgeable and skilled in implementing diabetes MNT be the team member providing nutrition care and education.[1]

In the early 1990s, a consensus panel of recognized experts in diabetes and nutrition developed the first set of standardized practice guidelines for MNT provided by RDs for persons with Type 2 diabetes. These practice guidelines provide a framework to assist the RD in the assessment, intervention, and evaluation of the outcomes of MNT. Practice guidelines for nutrition care recommend that patients with Type 2 diabetes be referred to an RD within the first month after diagnosis for a series of 2-3 visits totaling approximately 2½ hours. A nutrition assessment (i.e., patient's medical, lifestyle, and psychosocial issues), and intervention (i.e., nutrition prescription, education, and goal setting) are completed at each visit

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according to specific criteria defined in the practice guidelines. An evaluation of the patient's progress is made at each follow-up visit, and the nutrition prescription is modified as needed.

The RD is also responsible for communicating with the physician and other members of the diabetes care team throughout the process, and for making recommendations for changes in medications based on nutrition intervention outcomes. Table 1 displays the desired outcomes at 4-6 weeks after the initial MNT visit. The practice guidelines also delineate a set of basic MNT survival skills needed by all persons with diabetes and a list of essential educational topics for ongoing nutrition self-management. The basic survival skills include the following: basic food/meal planning guidelines; exercise guidelines; signs, symptoms, treatment, and prevention of hypoglycemia; nutritional management during short-term illness; self blood glucose monitoring (SBGM) instruction if needed; and a plan for continuing care.[2,3]

Table 1. Desired outcomes of medical nutrition therapy (MNT) for Type 2 diabetes*

Indices	Desired Outcomes at 4-6 Weeks after Initial MNT Visit
Glycemic Control: FBS**	Downward trend (~10%) or at target goal; if not, recommend nutrition or medical therapy changes
Glycemic Control: HbA_{1c}***	Downward trend (~10%) or at target goal
Lipids: Total Cholesterol	If cholesterol is elevated, a 6-12% decrease
Weight	If elevated, a weight loss of 3-6 pounds
Food/Meal Planning	Positive changes in food selection, amounts, frequency, and timing of meals
Exercise	Physical activity level gradually increased or continued

* Based on original practice guidelines established in 1995
** Fasting blood sugar
*** Hemoglobin A1c

During 1992-1993, the *Nutrition Practice Guidelines for Type 2 Diabetes* were field tested through a prospective, randomized, controlled clinical trial comparing two levels of MNT (practice guidelines care and basic care) on metabolic control in persons newly diagnosed with or currently undergoing treatment for Type 2 diabetes at three diabetes centers in Minnesota, Florida, and Colorado. The study was conducted by the International Diabetes Center under a contract with the American Dietetic Association. Results were positive, indicating that MNT provided by RDs resulted in significant improvements in medical and clinical outcomes in both the basic care and practice guidelines care groups; more substantial improvements were noted in the practice guidelines group.[4]

In the Indian Health Service (IHS), however, little was known regarding the extent of implementation of the practice guidelines by RDs in the field, or the resulting impact on patient outcomes. Therefore, in 1997, a proposal was submitted on behalf of the IHS Nutrition Section and approved for funding by the IHS Office of Planning, Evaluation, and Legislation to further investigate these issues.

Objectives

The intent of the study was to

- Assess the extent to which RDs at IHS and tribal health care facilities are able to provide the level of care recommended by the American Dietetic Association *Nutrition Practice Guidelines for Type 2 Diabetes*.
- Evaluate the impact of MNT provided for patients newly diagnosed with Type 2 diabetes on the following clinical outcomes: glycemic control (i.e., fasting blood glucose, random blood glucose, hemoglobin A_{1c}), total cholesterol, weight; and behavioral outcomes (e.g., achievement of established eating and exercise goals).
- Analyze differences in the level of comprehensiveness of MNT provided compared with patient outcomes.
- Identify potential barriers that might hinder the extent that practice guidelines care can be delivered by dietitians at IHS and tribal health-care facilities.

Research Design and Methods

The original methodology proposed collecting data through a retrospective chart audit of a representative sample of American Indian and Alaska Native adults ages 18 years or older who were newly diagnosed with Type 2 diabetes (diagnosis date between January 1993-December 1995). A total of 400 patient records, 200 in the intervention group and 200 in the comparison group, were needed to obtain a representative sample size and to provide sufficient power to determine whether there was a difference between the two groups.

The intervention group was defined as persons who had one or more diabetes-related MNT encounters with an RD during the 12 months following initial diagnosis. These were matched with a comparison group of persons of the same age group (18-34 years versus >35 years), sex, and type of initial diabetes treatment (diet/exercise alone versus any medication or combination of medications) who had no contact with an RD. Patients with any of the following conditions that could potentially affect key clinical outcomes were excluded from the audit: cancer, steroid treatment, heart attack/stroke, prescription medications for obesity, or renal disease.

Approximately 20 participant sites were necessary out of a sampling universe of all IHS, tribal, and urban (I/T/U) health programs with dietitian services, which would result in each

site having to complete only 20 randomized chart audits (10 intervention group records matched with 10 comparison group records). This method would prevent the audit process from becoming unnecessarily burdensome for local staff. An initial solicitation letter was mailed to all I/T/U sites with RD services. The letter explained that participation was voluntary, subject to approval by the local service unit or health director, and dependent on the site meeting the following pre-selection criteria:

- participation in the IHS Diabetes Audit (rationale: previous experience in monitoring diabetes clinical data and in conducting comprehensive chart audits);
- minimum number of 50 patients newly diagnosed with Type 2 diabetes between January 1993-December 1995 (rationale: adequate number of records allowing for drop-out);
- active quality assurance (QA) program on site (rationale: potential participation by local QA officer as a chart auditor for the project); and
- feasible method of identifying patients with Type 2 diabetes and corresponding dates of diagnosis (e.g., IHS Resource Patient Management System [RPMS] or current diabetes registry).

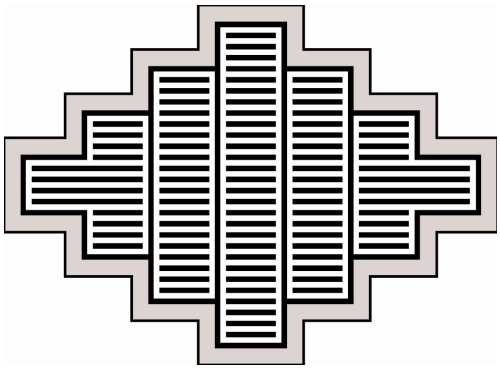
Chart audit forms were developed by the project coordinators and reviewed by personnel from the International Diabetes Center and IHS Headquarters, IHS Area, and local dietitians. A site information form was also developed to assess basic characteristics of the site such as RD staffing levels, current number of patients with diabetes, standing orders and protocols for delivery of MNT, average length of time for initial and follow-up visits with the RD, and any existing limitations that could potentially affect the ability of the RD to provide MNT for patients with diabetes.

A simple scoring system based on key components of practice guidelines care was developed and used during the data analysis phase of the project to assess the overall comprehensiveness of the medical nutrition therapy provided to patients in the intervention group. The intent was to compare the level of MNT comprehensiveness to resulting patient outcomes. The following components of practice guidelines care were factored into the scoring system:

- *nutrition assessment* (patient's weight history, usual food intake patterns, current exercise habits, awareness of target blood-glucose goals, practice of SBGM),
- *nutrition intervention* (covering what/when/how much to eat, when/how much to exercise, how to recognize and treat hypoglycemia),
- *goal setting* (eating and exercise goals established), and
- *timing and duration* of visits (first visit occurring within 1 month of diabetes diagnosis for a minimum duration of 60 minutes; minimum duration of 30 minutes for follow-up visits).

A project protocol manual was developed to provide uniform guidance and instructions for chart auditors. The study methodology and audit materials were pretested at four IHS/tribal hospitals and clinics before initiating the project, and modifications were made based on the input received.

Before initiating the audits, written medical record access approval was obtained from each participating site's privacy act systems manager (for IHS sites) or health director (for



tribal/urban sites) according to IHS protocol. Group training was provided for all chart auditors to ensure consistency in sample selection and data abstraction. Auditors were selected on a voluntary basis and consisted of RDs, QA officers, and other health professionals. To eliminate the potential for bias, RD auditors were not permitted to abstract data from the records of patients they had personally counseled.

Auditors were instructed to begin with a random sample of 50 medical records from the total number of patients, ages 18 years or older, diagnosed with Type 2 diabetes between January 1, 1993 and December 31, 1995, at each participating site. Next, an initial screening process was completed to eliminate those patients with any of the disqualifying conditions specified, and to assign the remainder to either the intervention or comparison groups, based on whether or not they had seen an RD for diabetes-related MNT within the 12 month period following diabetes diagnosis. Intervention and comparison records were then matched according to the criteria previously specified until the required number of 20 (10 successful matches) was achieved. If this number could not be achieved, auditors were instructed to return to the original list of patients with Type 2 diabetes, select a second random sample of 50 additional medical records, and repeat the process.

Results

Twenty-seven sites originally expressed interest in participating in the study; out of these, 17 met the site selection criteria, completed the chart audit process, and submitted data. These 17 sites represented the following IHS Areas: Aberdeen, Alaska, Albuquerque, Bemidji, Billings, Nashville, Navajo, Phoenix, Portland, and Tucson.

We encountered several obstacles during the data collection phase of the project that limited the total number of records that could be used. At some locations, policy mandated that the RD see every patient with diabetes, making it impossible to generate records for a legitimate comparison group. For other sites, after an initial screening of the charts was completed, we discovered that a sufficient number of records meeting either the intervention or comparison group criteria was not available. As a result, the actual number of useable records was 176 (88 intervention group; 88 comparison group).

The intervention and comparison groups were successfully matched according to the criteria specified. Key information is summarized in Table 2.

Table 2. Intervention vs. Comparison Group

Criteria	Intervention (±SD*)	Comparison (± SD*)
# of Records (N)	88	88
Gender = Male	N=50 (56.8%)	N=49 (55.7%)
Gender = Female	N=38 (43.2%)	N=39 (44.3%)
Mean Age (N=88/88)	44.8 Years (±11.6)	45.3 Years (±12.6)
Mean Age at Dx** (N=78/77)	41.5 Years (±10.7)	42.4 Years (±11.7)
Mean Height (N=86/78)	66.3 Inches ±3.5)	66.0 Inches (±4.2)
Rx: Diet/Exercise Only	N = 38 (43%)	N = 33 (38%)
Rx: Medications (insulin/oral)	N = 50 (57%)	N = 52 (59%)
Rx: Unknown	N = 0	N = 3 (3%)

* Standard Deviation
** Diagnosis

Characteristics of Participating Sites and Potential Barriers to Nutrition Care. The mean number of patients with Type 2 diabetes among the 17 sites was 975, with a range of 235-3483. The mean number of RDs per site (expressed in full time equivalents [FTEs]) was 2.13. This resulted in an RD-to-diabetes patient ratio of 1:458. Slightly less than one half of the sites (47.1%; n=8) reported having implemented the MNT *Practice Guidelines for Type 2 Diabetes*, and only three sites incorporated the practice guidelines into their local diabetes policies and procedures. Eleven (64.7%) of the sites reported having a standing protocol for referral to the RD. The average length of an initial diabetes MNT visit was 56 minutes (±11.1 minutes; range=30-75) and a follow-up visit averaged 31 minutes (±8.9 minutes; range=15-45).

It is noteworthy to mention that more than one-half of the participating sites (52.9%) reported an increase in the average number of patient referrals to the RD for diabetes MNT during the previous year. A total of 58.9% of the respondents also answered affirmatively when asked if they felt limited in the number of MNT visits that could be provided for patients with Type 2 diabetes during the 12 months following initial diagnosis (5.9%=great deal of limitation; 41.2%=somewhat limited; 11.8%=minimal limitation). Nearly three-fourths of these respondents (72.7%) attributed limitations to an RD staffing shortage and/or a local budget limiting the number of RDs that could be hired. A total of 9.1% noted RD staff turnover as a limitation, 9.1% noted recruitment/retention difficulty because of remote locations, and another 9.1% noted that other diagnoses took priority over Type 2 diabetes.

Comprehensiveness of Nutrition Care Based on Practice Guidelines Recommendations. The average number of MNT visits per patient during the 12 months* following initial diabetes diagnosis was 1.9, with a median of 1.0 (SD=1.9). The range in number of MNT visits was 1-14; however, 93% of patients had 1-2 MNT visits during the 12-month period. By comparison, the MNT practice guidelines recommend 2-3 visits during the first six months following diabetes diagnosis.

Table 3 summarizes the overall comprehensiveness of MNT offered at participating I/T/U sites as evaluated through accomplishment of the key components of practice guideline nutrition care. Overall, the components of practice guidelines MNT care most thoroughly covered were assessment of food intake (addressed with 89.8% of patients); intervention concerning what, when, and how much to eat (addressed with 84.1% of patients); and establishment of eating goals (addressed with 80.7% of patients). In contrast, the following components of the practice guidelines care were addressed with less than 50% of the patients: assessment of SBGM practices and knowledge of target blood glucose goals (12.5% of patients), intervention concerning how to recognize and treat hypoglycemia (4.5% of patients), and establishment of exercise goals (45.5% of patients). The recommended duration of MNT visits, 60 minutes or longer for an initial encounter and 30 minutes or longer

Table 3. Comprehensiveness of MNT provided to Intervention Group (N = 88)

Key Components of Practice Guidelines Care	# of Patients (N) for which Component was Addressed	% of Patients for which Component was Addressed
Assessment		
Weight History	60	68.2%
Food Intake	79	89.8%
Exercise Habits	60	68.2%
SGBM Knowledge/Targets	11	12.5%
Intervention		
What/When/How Much to Eat	74	84.1%
When/How Much To Exercise	47	53.4%
Recognition/Treatment of Hypoglycemia	4	4.5%
Plans/Goal Setting		
Eating Goals Set	71	80.7%
Exercise Goals Set	40	45.5%
Timing of 1st MNT Visit		
> 1 Month after DX	30	34.1%
< 1 Month after DX	58	65.9%
Length of MNT Visit		
< 60 min. Initial; < 30 min. F/U*	26	31.0%
< 60 min. Initial; > 30 min. F/U*	10	11.9%
> 60 min. Initial; > 30 min. F/U*	48	57.1%

* F/U: Follow-Up Visits

* A 12-month period following initial diabetes diagnosis was assessed in this study rather than the 6-month period used in the MNT practice guidelines field test. We believed that this time period was more realistic for the IHS/tribal community setting, given the staffing shortages and patient follow-up issues that often exist, as well as the site-to-site differences in care delivery, as opposed to the more controlled environment of the diabetes centers where the MNT practice guidelines were originally field tested.

for follow-ups, was met for 57.1% of patients.

Clinical & Behavioral Outcomes. Changes in glycemic control, weight, and cholesterol in the intervention and comparison groups are summarized in Tables 4, 5, and 6, respectively. A more positive trend toward improved glycemic control seemed to occur in the intervention group, which was evidenced by a greater magnitude of decrease in FBS, RBS, and HbA_{1c}, and smaller standard deviations. An average loss of 3.4 pounds occurred (mean percent change of -1.08%) in the intervention group 12-15 months after the initial MNT visit compared with a 1.5 pound gain (mean percent change +0.84%) in the comparison group 12-15 months after diabetes diagnosis. Results were not statistically significant at the p=.05 level.

Table 4. Measures of glycemic control

Indices	N	Mean % Change	Mean Unit Change	± SD	Range of Unit Change
FBS			**mg/dl**		
MNT Group*	11	-15.8	-41.0	67.8	-132.0 - +88.0
Comparison	13	+3.26	-31.15	143.02	-232.0 - +258.
RBS			**mg/dl**		
MNT Group*	15	-27.9	-104.13	137.2	-406.0 - +64.0
Comparison	11	-7.07	-60.06	160.9	-315.0 - +249.0
HbA_{1c}			**%**		
MNT Group*	4	-18.9	-1.67	1.45	-3.2 - +0.30
Comparison	1	-1.59	-0.10	0.0	-0.10 - -0.10

* Changes after 2 MNT visits

Table 5. Weight changes

Indices	N	Mean % Change	Mean Unit Change (lbs)	± SD	Range of Unit Change
Weight:					
MNT Group*	56	-1.08	-3.4	18.07	-70.0 - +28.0
Comparison	58	+0.84	+1.5	14.7	-28.0 - +35.0

* Changes after 2 MNT visits

Table 6. Cholesterol changes

Indices	N	Mean % Change	Mean Unit Change (mg/dl)
Cholesterol:			
MNT Group*	4	+8.9	+5.25
Comparison	5	-9.77	-25.4

* Changes after 2 MNT visits

For cholesterol, there was an 8.9% increase in the mean value (average increase of 5.25 mg/dL) in the intervention group, as compared to a mean percent decrease of 9.77% (average decrease of 25.4 mg/dL) in the comparison group. However, it should be noted that the use of lipid-lowering medications, a variable that might have impacted this outcome, was not assessed in the study. Sample size was small and should be interpreted with caution.

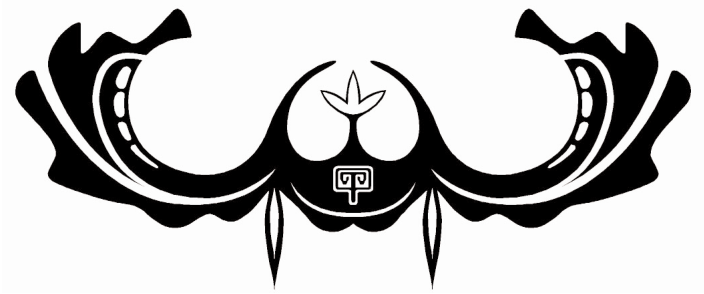
The study also evaluated whether patients had received general nutrition or exercise information from health professionals other than RDs. A total of 79.5% of patients in the intervention group, compared with 62.8% in the comparison group, had been exposed to some form of nutrition or exercise message from a non-RD. This factor was statistically significant, although the accuracy and comprehensiveness of this information was not assessed.

Behavioral outcomes were evaluated based on the percentage of patients in the intervention group who met individualized eating and exercise goals established during the MNT encounter. At the initial MNT encounter, 77.3% of patients (N=68) set eating goals with the RD; 16.2% of these (N=11) met or partially met these goals at a follow-up visit. A total of 89% of patients (N=78) set eating goals during any MNT visit with the RD (initial or secondary contact), and 19.2% (N=15) met or partially met these goals at a follow-up visit. For exercise, 43.2% of patients (N=38) set goals during the initial MNT encounter, and 15.8% (N=6) met or partially met these goals at a follow-up visit. A total of 55.7% of patients (N=49) set exercise goals during any MNT visit, and 20.4% (N=10) met or partially met these goals at a follow-up visit.

Comprehensiveness of MNT and Patient Outcomes. MNT treatment scores ranged from 5-16 (there was one outlier at 23) but clustered around the 9-12 point range. Points were assigned for meeting key components of practice guidelines care; a maximum score of 14 plus 1 additional point for each visit was possible. Because of the tight distribution of scores, an easy comparison with patient outcomes could not be made; therefore, this objective could not be evaluated.

Limitations and Conclusions

Small sample size was a major limitation of this study, and this resulted from several factors. Many patients in the inter-



vention group did not return for a follow-up appointment with the RD within the 12-month time frame, making it impossible to evaluate whether clinical or behavioral changes occurred. Of those patients who did return, several did not have repeat lab work, so changes could not be adequately assessed. Nonetheless, this study was the first of its kind conducted at I/T/U sites, and the findings identify some interesting trends that should be explored further in future research.

The most interesting finding is what appeared to be a positive trend in blood-glucose control in the MNT intervention group, a key outcome desired in diabetes care. This was evidenced by a greater magnitude of decrease in FBS, RBS, and HbA_{1c} and smaller standard deviations in the FBS and RBS categories. Weight also appeared to be favorably influenced in the MNT group, with patients losing an average of 3.4 pounds compared with a 1.5 pound gain in the comparison group. These results were not statistically significant but could be confirmed through a follow-up study with larger sample sizes.

The increase in cholesterol in the intervention group, compared with a decrease in the comparison group, was based on a small data set and differed substantially from the results of a 1995 Massachusetts Dietetic Association study.[5] The Massachusetts study documented an 8.6% mean reduction in serum cholesterol levels among outpatients who saw an RD for a minimum of two MNT visits; however, it was also based on a larger sample size and excluded patients on lipid lowering medications. If similar research is conducted at I/T/U sites in the future, lipid-lowering medications should be added to the exclusion criteria and the sample size should be increased.

A total of 79.5% of patients in the intervention group were exposed to some form of nutrition information or message from another health professional (non-RD) as opposed to 62.8% in the comparison group (p=.015). This exposure might have helped by reinforcing what occurred during the MNT encounter and by presenting more of a team approach to diabetes nutrition care. However, no mechanism was in place to assess the quality or accuracy of this information.

In general, it appears that participating I/T/U sites were closer to providing basic, rather than practice guidelines care for patients with Type 2 diabetes at the time the study was conducted in 1997-1998. Although a substantial number (65.9%) of initial MNT visits occurred during the first month after diabetes diagnosis and were reported to be of adequate length (average: 56 minutes), the average frequency and duration of follow-up visits were not sufficient to meet practice guidelines recommendations. The following components of care, which are three of the six essential MNT survival skills needed by all persons with diabetes, were addressed with less than 50% of patients: assessing SBGM practices and knowledge of target goals, instruction on how to recognize and treat hypoglycemia, and setting exercise goals. It should be noted that the study did not assess whether any of these topics were addressed by another member of the diabetes team or addressed by the RD but absent from his/her documentation.

Finally, and most importantly, the results of this study should raise awareness of existing barriers to the provision of practice guidelines nutrition care at some I/T/U facilities and other trends that might affect the ability of the RD to deliver comprehensive care. The average RD-to-diabetes patient ratio is 1:458, and 47% of participant sites reported anywhere from some degree to a great deal of limitation in providing adequate MNT care for newly diagnosed diabetes patients. These statistics, coupled with the fact that 52.9% of sites reported an increasing number of referrals for diabetes MNT, will continue to present challenges to the provision of adequate and effective nutritional care, unless additional resources are invested. Despite these challenges, the positive trends in glycemic control and weight loss warrant further investigation.

Results of this study were presented at the May 1999 IHS Professional Nutrition Seminar to an audience of RDs from I/T/U sites across the country. Further communication of these findings to tribal leaders, I/T/U health administrators, and IHS

officials nationwide should help raise awareness of the importance of qualified RDs in the field and the need for enhanced RD recruitment and retention systems to improve MNT services for American Indians and Alaska Natives with Type 2 diabetes.

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Yakama Nation Initiatives to Promote Seat Belt Use

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The leading cause of death for Native Americans between birth and 44 years of age is motor vehicle crash injuries. In 1995, the United States motor vehicle crash death rate was 19 per 100,000 people, while the 1996 Yakama Nation rate was 120 per 100,000.

The Yakama Nation has 20,000 American Indians within and around the boundaries of its 1.4 million square acres of land base. The total enrollment of the Yakama Nation is 9,400. Two major highways cross through and/or surround the Yakama Reservation: Interstate 82 and Highway 97. Additionally, many county roads are used for agriculture and timber transport.

To address the motor vehicle crash problem, the Yakama Nation instituted multiple strategies based on the "3 E's" of injury prevention: Education, Enforcement, and Environmental modification. The Yakama Nation MCH Program and the Office of Environmental Health (OEH) implemented an education and distribution program for infant and child safety seats in 1996. The educational component was a hands-on classroom activity that took place during prenatal clinics at regularly scheduled times. The course was one hour in length and the OEH instructor was available after class for one-on-one questions.

A review of the program in November 1997 led to addi-

tional training for the three MCH staff members conducting the child safety program, implementation of a patient education documentation process, and establishment of a car seat distribution registry. In addition, an observational survey was conducted to assess the rate of car seat and seat belt use. Observations were made at several sites:

Yakama Service Unit (YSU)
The Yakama Nation crossroads
Bureau of Indian Affairs (BIA)
Indian Health Service (IHS) employees and the general public
Yakama Nation Well Child Clinics (YNWCC) at Toppenish, Wapato, and White Swan
The Annual Yakama Nation General Council

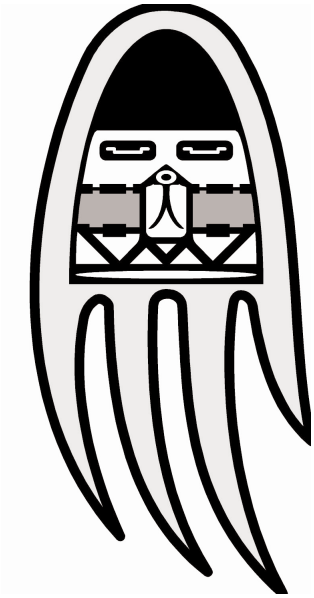
The survey found that only 17% of the population was buckling up. Restraint use among children was even lower: only 10% of child passengers were appropriately restrained. Many families transported their infants in cradleboards rather than safety seats. Some cradleboards were held in the parents' arms or were placed on the car seat with the adult seat belt over the cradleboard.

These findings prompted an intensive public awareness and education campaign. The campaign included one-on-one education with all expectant mothers and fathers through the Yakama Nation Maternal Child Health (MCH) Program; projects with five high school Indian clubs on the Yakama Indian Reservation; the creation and distribution of posters sending the message "Buckle Up," and the use of public service announcements on television. After one year, seat belt usage increased to 41%. Six months after the campaign ended, however, seat belt usage decreased to 35%. This decline was probably due to a lack of consistency in providing education, waning awareness, and a failure to provide sufficient numbers of infant and child safety seats.

Realizing that education efforts alone were of limited effectiveness, a coalition was formed on the Yakama Reservation in October 2000 committed to passage of a primary seat belt law. A primary law allows police officers to stop and issue citations to motorists who transport children unrestrained by approved safety devices. A secondary law prevents officers from stopping vehicles with unrestrained passengers unless there is some other moving violation, such as speeding or drunk driving. Primary laws, when enforced, have been shown to be much more effective than secondary laws in promoting restraint use.

The coalition had the support and approval of the Northwest Portland Area Indian Health Board (NPAIHB), the United States Public Health Service Indian Health Service (IHS), and the Portland Area IHS Area Director, Doni Wilder. In addition to recruiting experts to testify before the Tribal Council and summarizing the available data on restraint use and motor vehicle crashes, the coalition conducted a medical chart review. The review involved charts from 133 newborns, representing one-third of all infants born during the previous year. It revealed that many newborns were not receiving car seats at discharge from the hospital because the MCH Program lacked sufficient funds to purchase adequate numbers of safety seats.

In December 2000, the coalition's goal was realized. In passing the primary seat belt law, the Tribal Council of the Yakama Nation required that intensive efforts to educate the population about passenger safety and the new law begin immediately. The Council also specified that law enforcement institute a policy of one verbal warning, one written warning, and then issuing a citation. Tribal administration was directed to set up a budget for the purchase of infant and child safety and booster seats. Fifty percent of the $47 fine for seat belt violations would go towards the purchase of safety seats. Continuing efforts to promote the use of seatbelts in the Yakama Nation will undoubtedly save many lives.



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