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Instituting Modest Therapeutic Lifestyle Changes for Those at High Cardiometabolic Risk

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Patient noncompliance with therapeutic lifestyle interventions is among the most significant issues in preventive endocrinology and cardiology. Such is the dilemma in which many of us find ourselves when invoking meaningful lifestyle changes for ourselves and our American Indian/Alaska Native (AI/AN) patients in the current era of lipid altering drug therapy. Most clinicians are aware that therapeutic lifestyle changes (TLC) often fail to achieve blood lipid and lipoprotein target goals, e.g., TG <150 and LDL-C <100 mg/dl. The results are much the same when it comes to achieving lasting body weight reduction. One longstanding "statin" promotional advertisements reads, "When diet and exercise fail, meet another candidate for lipid lowering therapy . . .." It's almost subliminal that we fail before we start.

Indeed, TLC often fail to achieve more aggressive laboratory goals, but most often do not fail to reduce risk. Except for those with major heritable lipid and metabolic issues, a disordered lifestyle is most probably responsible for the majority of lipid and metabolic disorders we see in the clinic. If we look at TLC outcomes with regard to cardiometabolic (CMR) disease risk reduction, particularly reduction in diabetes risk, there are a plethora of very beneficial physiological changes that occur with or without significant changes in LDL-cholesterol or body weight. The point is that small incremental changes in lifestyle habits are clinically quite beneficial, and this frame of reference has been lost, merely because the patient's modest lifestyle changes are not perceived to be sufficient to reach laboratory-driven targets. I am in no way minimizing the value of more aggressive and holistic lifestyle changes for those who are motivationally ready to change, but there are options for those who are more ambivalent and otherwise not ready for a complete lifestyle makeover.

The advent of at least seven classes of drug therapies to manage dyslipidemia has for many providers created a convenient, evidence-based justification for spending less time on more thorough teaching about modification of dietary and physical activity behaviors. To be sure, the magnitude of TLC intervention necessary to achieve current LDL-C target thresholds for many requires gladiator-level commitment.

Here is a key question, though. Is it not our overall clinical (and public health) mission to reduce risk of cardiometabolic disease? And if so, are there not metabolic mechanisms by which lifestyle changes interact to do just this – many of which are not uniquely married to blood lipid or even body weight changes?

We all are well aware of the impressive Diabetes Prevention Program (DPP) outcomes. The 58% reduction in new onset diabetes occurred with a mere 5% weight loss, despite the 7% targeted goal at the beginning of the study.[1] These outcomes were achieved with very modest dietary intervention and approximately 1000 kcal of exercise a week. The DPP Outcomes Study reinforced this success at ten years of follow up with a 34% decreased incidence of diabetes compared with controls.[2] A recent 20-year follow-up analysis of the Da Qing Chinese Diabetes Prevention Study using TLC to manage diabetes risk indicated that the TLC group had a

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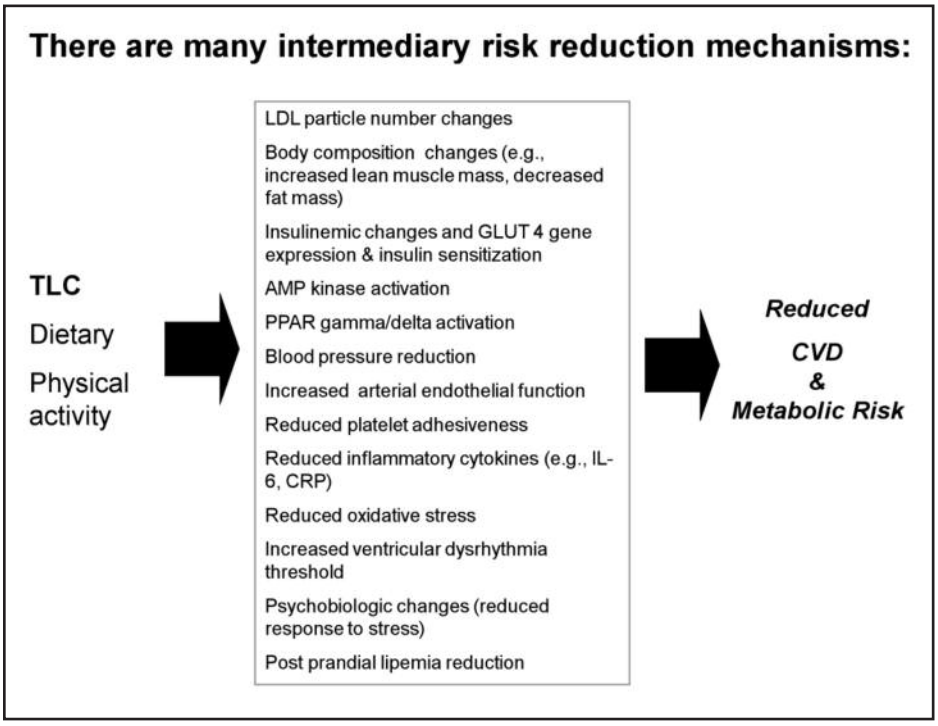
51% lower incidence of diabetes during the active intervention period and a 43% lower incidence controlled for age.[3] These results were attained with very modest changes in blood lipids and body weight. If a patient is only able to add 9 or 10 miles a week (~1.2 miles/day) to their weekly activity, they have essentially achieved the same weekly energy expenditure as those who completed the DPP and other diabetes prevention studies with impressive results.

The "Pleiotropic" Effects of TLC: A Brief Look at the Evidence

Figure 1 depicts some of the core mechanisms by which dietary and physical activity behavior changes can improve cardiometabolic health, including, but not limited to anthropometric and blood lipid changes. This concept of TLC pleiotropy (secondary outcomes) is not new. One of the most cogent examples of evidenced-based TLC pleiotropy is the response to Mediterranean diet therapy for which there are many elements congruent with AI/AN lifestyles. The Mediterranean diet is one of the most studied dietary regimens to combat cardiovascular disease risk and it represents a "whole" dietary pattern in that it emphasizes good sources of carbohydrates (whole grains), fats (unsaturated plant oils and omega-3 fatty acids), and proteins (nuts, legumes, fish, and poultry); an abundance of fruits and vegetables; and minimal intake of refined grains, sugar-sweetened beverages, and red meat. Katherine Esposito of the Second University of Naples demonstrated significant increases in insulin sensitivity, improved arterial endothelial function, and decreases in inflammatory markers (CRP, IL-6, IL-7, and IL-18) in 90 patients in response to two years of Mediterranean dietary intervention.[4] Olive oil and red wine antioxidant polyphenols transcriptionally inhibit endothelial adhesion molecule expression, thus partially explaining atheroprotection from these selected nutrients in Mediterranean and other dietary regimes.[5] More recently Esposito has shown in two trials a positive effect of a Mediterranean diet on reversal of the metabolic syndrome as well as its utility ameliorating features of fatty liver in obese patients with insulin resistance and diabetes.[6] A Mediterranean diet that is moderately lower in carbohydrate (45%), and moderately higher in fat (35 - 40%), with less than 10% of saturated fat, is not as stringent as very low fat or very low carbohydrate dietary interventions, but can still reverse these hepatic and metabolic syndrome features.

Figure 1. Pleitropic mechanisms of therapeutic lifestyle changes



In 2006 we conducted a trial using 19 weeks of TLC -- 1200 kcal/week of aerobic exercise and decreased energy intake -- in 37 overweight insulin resistant patients. It showed significantly greater efficacy in improving insulin sensitivity, LDL particle number, and fasting glucose compared to 30 mg/day of pioglitizone.[7] Such findings are not isolated discoveries, with over 150 TLC efficacy trials published since 2000.

Lastly and perhaps most provocatively, Mediterranean dietary qualities have been shown to reduce the incidence of new onset diabetes. Savado demonstrated a 52% decrease in the incidence of new onset type 2 diabetes in a randomized trial in 418 nondiabetic subjects aged 55 - 80 years as part of the PREDIMED study in Spain.[8] What was noteworthy in Savaldo's study was that diabetes risk reduction occurred in the absence of significant changes in body weight or physical activity.

Modest Increases in Physical Activity are Beneficial

Exercise is not generally considered primary therapy for lipid disorders, especially in the current era of lipid-altering drug therapy. This is unfortunate, because physical activity of appropriate quality and quantity can clearly reduce cardiometabolic risk through nonlipid mechanisms. Exercise can also induce significant favorable changes in the lipoprotein profile only partly related to changes in adiposity. Kraus was among the first to show in a well controlled trial comparing various weekly volumes and intensities of exercise

that regular exercise with minimal weight change has broad beneficial effects on the lipoprotein profile – even without changes in total cholesterol and Friedewald predicted LDL-C.[9] Kraus demonstrated that moderate volumes and intensities (walking ~12 miles per week at 40-55% of aerobic capacity) can significantly reduce nuclear magnetic resonance spectrometry-measured LDL-particle number when total cholesterol and Friedewald-predicted LDL-C remained unchanged. Such patients on a return clinic visit would be considered unresponsive to exercise therapy when a conventional lipid profile was used to score the patient's progress. LDL particle number has gained much clinical trial support in recent years as a better predictor of cardiovascular events than LDL-cholesterol.[10]

Improved arterial endothelial function is thought to be one of the primary mechanisms responsible for reduced CVD morbidity and mortality.[11] Numerous trials have demonstrated improvements in arterial endothelial function with sufficient exercise training.[12,13] Dietary elements such as omega-3 fatty acids, walnuts, and olive oil have also been shown to significantly improve endothelial function and reduce postprandial lipemia.[14,15] Postprandial lipemia also adversely affects arterial function. When postprandial triglyceride-rich lipoproteins are significantly elevated, especially after a fat-rich meal, arterial walls are exposed to a variety of atherogenic lipoproteins (e.g., intermediate density lipoproteins), and there is a transient reduction in endothelial function. Single 30 - 45 minute exercise sessions, for example a 45 minute moderate pace walk, can significantly reduce postprandial triglyceride levels.[16]

Similar Mechanisms as Biquanides and Thiazolidinediones

Both moderate and intensive exercise sessions utilize similar metabolic mechanisms as several diabetes drug classes, such as the biguanides (metformin) and thiazolidinediones (pioglitizone, rosiglitizone) but without many of the side-effects, e.g., fluid retention caused by the latter. The value of brief acute bouts of physical activity, e.g., 2 - 5 minute intentional bouts of physical activity at moderate intensities, activate AMP kinase, glucose transport mechanisms, and insulin signaling. Each intentional walking step is an AMP kinase activator (AMP-activated protein kinase is an enzyme that works as a fuel gauge that becomes activated during physical activity), which works similarly to metformin and the PPARγ (peroxisome proliferator-activated receptor-gamma) activating diabetes drugs.[17] Well engineered step-filtered pedometers measure these insulin sensitizing muscular contractions by registering step counts. Both aerobic and resistance exercise training improve insulin sensitivity and glucose transport mechanisms, which help to improve cardiometabolic health and are involved in deterring diabetes in prediabetic subjects. Perhaps the most promising of the metabolic mechanisms physical activity has to offer is its ability to upregulate PPARδ receptors in skeletal muscle.[18,19] PPARδ (delta) receptors are intimately involved in fatty acid transport, inflammation, and increased HDL-C – thus improving multiple aspects of the metabolic syndrome. Future development of diabetes drugs will target PPARδ, essentially mimicking the many benefits of exercise. There is also emerging evidence from investigators at Duke University that exercise training can reverse skeletal muscle mitochondrial abnormalities from lipid overload induced by high fat load diets and inactivity.[20]

Is It the Weight Loss or Physical Activity Itself ?

In one of the most elegant clinical exercise science reviews recently published, Richard Telford, physiologist at the University of Melbourne, showed that the scientific literature demonstrates strong associations between physical activity (PA) and mortality and morbidity associated with type 2 diabetes, *after* controlling for obesity and other potentially confounding factors.[21] Collectively, these findings indicate that low PA is not just a predictor, but a direct cause of metabolic dysfunction and the morbidity and mortality associated with diabetes. Considering the many cellular mechanisms that can help explain this, this finding is not difficult to justify. By contrast, Telford argues, there is little evidence that overfatness and obesity (adjusting for any effect of reduced PA) actually cause diabetes. Observational studies suggest that obesity, including viscerally sited obesity, is most appropriately categorized as a marker or predictive (noncausal) risk factor for type 2 diabetes, although, in contrast to PA, several studies were not able to detect any significant correlation after controlling for PA. The findings are consistent with the premise that PA is of direct benefit, perhaps even essential to preventive and curative medicine in relation to insulin resistance and type 2 diabetes. In support of Telford's argument, Church's investigation of 2,316 men with diabetes over 16 years of age found that low-fitness individuals were at 2.7 times the risk of dying of CV disease compared with the normal-weight men of high fitness, irrespective of whether they were of normal weight, overweight, or obese.[22]

Waller and coworkers provided provocative support for the independent effect of physical activity to reduce diabetes by following the physical activity patterns of 8,182 twin pairs for nearly 30 years.[23] They found that sufficient physical activity significantly reduces the risk for type 2 diabetes when controlled for genetic predisposition and childhood home environment. This was seen in the pairwise analyses among both MZ and DZ pairs, including those using BMI-adjusted data. It can therefore be assumed that physical activity independently protects against diabetes, as many unmeasured confounding factors (both genetic and environmental) are controlled for by the twin design.

Lastly, Lopez-Soriano and colleagues in Spain and France, who have focused their work on exercise induced PPAR nuclear receptor activation in both muscle and adipose tissue, cogently argue that physical activity is afforded little attention

in recent studies and reviews evaluating the link between insulin resistance, inflammation, and obesity.[24] They insist that physical activity is a potentially confounding factor which has been overlooked by many attempting to understand the role of obesity.

Regaining Our Enthusiasm for Modest but Measurable Changes in TLC

So, for those of us who have lost our frame of reference with respect to genuinely valuing lifestyle changes – even small changes – what incremental TLC behavior should we value for ourselves and our patients? It is now quite clear that pragmatic forms of TLC can reduce CMR risk with or without dramatic changes in LDL-C or reduced body weight. This has important implications for Indian Country, where at least one recent report found that in those 18 - 40 years of age, the overall prevalence of metabolic syndrome was 53.1%, and 44.9% after excluding individuals with diabetes.[25]

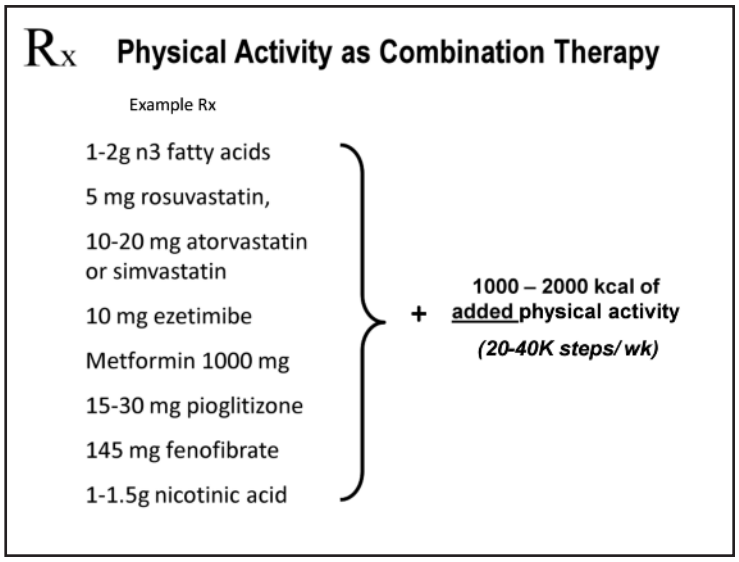
The following are some examples of useful lifestyle modifications:

1. Give your patients credit for each and every step they take (e.g., as recorded with well-engineered, reliable pedometers) irrespective of laboratory measures or body weight changes. Prescribe walking programs through the systematic use of clinical pedometry. Have patients record their weekly step-count (some devices have up to a six-month memory and step-filters that filter spontaneous movements (e.g., Accusplit 2720 and 120XLM models) which permit the patient to accurately record steps over a longer period of time without inadvertently resetting. At the patient's return visit chart and give credit for each and every recordable walking step much as you would for charting their glucophage or statin. There is good reason to believe that each intentional walking step (i.e., muscle contraction) is an AMPK and PPAR activator working very similarly to many of the antidiabetic agents. The step count is the principle outcome measure (not the estimated distance or caloric expenditure). For example, add at least 1000 kcal of exercise per week to the existing weekly activity pattern. This would be the equivalent of adding approximately 10 miles of walking a week or ~20,000 step counts on a reliable pedometer. Ideally, graduating to at least 1500 kcal week over time would be near optimal (~15 miles/wk) depending on goals. American Indian *Pedometer Trekking* protocols can also help and are posted on the IHS DDTP website.

2. When asking patients to change their dietary behavior, first make changes in only one food-group per visit, or even one problem food within a food group, rather than wholesale dietary changes. The *Mediterranean Diet Score* is another simple tool that scores on a 0 - 10 scale the relative compliance with Mediterranean dietary component choices that are made between clinic visits[26]; this scale is easily adaptable to American Indian populations. Individual and incremental changes in nut, soy, legume, fruit, and fish consumption can be translated to some level of metabolic risk reduction.

3. Write exercise prescriptions as combination therapy. Clinicians need to quantify and prescribe physical activity (in terms of kcal/day or week or stepcount/week) in combination with drug therapy when applicable (see Figure 2). For example, 1500 kcal of weekly exercise when added to omega-3 fatty acid therapy would further reduce triglycerides and VLDL-cholesterol, knowing that 1500 kcal of energy expenditure at moderate exercise intensities will oxidize intramuscular and adipose tissue stores of triglycerides and fatty acids.

Figure 2. Exercise as combination therapy



4. Begin to objectively score and chart TLC behaviors in the same way you would objectively chart laboratory measures on each patient visit. Each TLC measure in Figure 3 can be serially scored on a numerical or Likert scale (e.g., 0 - 10) and translated into some meaningful level of CMR risk reduction with or without changes in lipids or body weight. For example you can record the number of weekly *fast food encounters*, as defined as any fast food choice regardless of the size or caloric density of the food or beverage. Several metabolic syndrome clinics have

reported average FFE outcomes decreasing from 20 - 25 per week to 10 - 12. This is a very helpful behavioral measure that depicts patient's food choice behavior rather than calories or BMI changes.

Figure 3. Objectively scored TLC behaviors

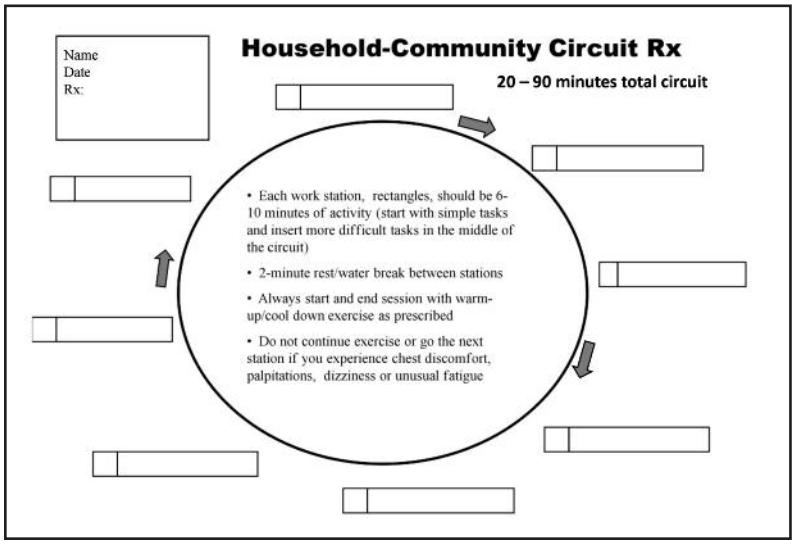
TLC Behaviors That Can be Objectively Scored

TLC Behavioral Outcomes

- Energy expenditure (kcal/day)
- Daily/weekly pedometer step counts/day/week/month
- Physical activity encounters/week
- Total caloric intake/day
- Fast food encounters/week
- Fruits and vegetable servings/week
- Minutes of moderate exercise/week
- Mediterranean diet score (0-10)

5. Systematize household/pueblo domestic chores into a circuit of short, utilitarian activities such that the patient expends 200 - 350 kcal during one household circuit session. This would provide a sense of accomplishing both household/yard/pueblo tasks as well as generating increased daily energy expenditure. Figure 4 depicts a patient household circuit prescription form with which the patient rotates between 6 - 10 minute work stations.

Figure 4. Household circuit activity Rx form

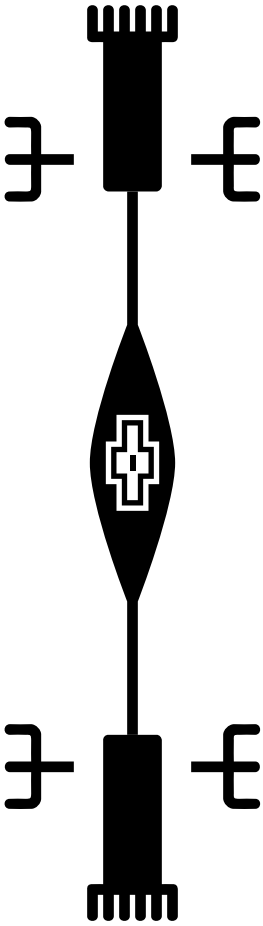


Many of these strategies are depicted graphically and narratively on the IHS DDTP website under the new *Quick Guide Cards* link and then under Physical Activity and Anthropometry. Interested readers may e-mail the author for more detailed protocols for 1) systematic clinical pedometry instructions for those at high CMR risk, 2) household circuit activity protocol instructions, or 3) a 15-month metabolic syndrome/CMR TLC flow-sheet. E-mail: *rlaforge@nc.rr.com*.

References

1. Knowler WC et al. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 346:393–403, 2002.
2. Diabetes Prevention Program Research Group. Ten-year follow up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study. *Lancet*. 374:1677-1688, 2009.
3. Guangwi L, Zhang P, Wang J, et al. The long-term effect of lifestyle interventions to prevent diabetes in the China Da Qing Diabetes Prevention Study: a 20-year follow-up study. *Lancet*. 371:1783-1789, 2008.
4. Esposito K, Marfella R, Ciotola M, et al. Effect of a Mediterranean-style diet on endothelial dysfunction and markers of vascular inflammation in the metabolic syndrome: a randomized trial. *JAMA*. 292:1440-1446, 2004.
5. Annunziata-Carluccio M, Siculella L, Ancora MA, et al. Olive oil and red wine antioxidant polyphenols inhibit endothelial activation: antiatherogenic properties of Mediterranean diet phytochemicals. *Arteriosclerosis, Thrombosis, and Vascular Biology*. 223:622-629, 2003.
6. Esposito K, Giugliano D. Mediterranean diet and the metabolic syndrome: the end of the beginning. *Metab Syndr Relat Disord*. 8(3):197-200, 2010.
7. Shadid S, La Forge R, Otvos JD, Jensen M. Treatment of obesity with diet/exercise versus pioglitazone has distinct effects on lipoprotein particle size. *Atherosclerosis*. 188:370-376, 2006.
8. Salas-Salvadó J, Bullo M, Babio N, et al. Reduction in the incidence of type 2 diabetes with the Mediterranean diet: Results of the PREDIMED-Reus Nutrition Intervention Randomized trial. *Diabetes Care*. DOI:10.2337/dc10-1288, 2010.
9. Kraus WE, Houmard JA, Duscha B, et.al. The effects of the amount and intensity of exercise on plasma lipoproteins. *NEJM*. 347:1483-1492, 2002.

10. Rosenson RS, Davidson MH, Pourfarzib R. Underappreciated opportunities for low-density lipoprotein management in patients with cardiometabolic residual. *Atherosclerosis*. Nov;213(1):1-7, 2010.
11. Esper RJ, Nordaby R, Vilarino JO, et.al. Endothelial dysfunction: a comprehensive appraisal. *Cardiovascular Diabetology*. 5:1-18, 2006.
12. Hambrecht R, Wold A, Gielen S, et al. Effects of exercise on coronary endothelial function in patients with coronary artery disease. *N Engl J Med*. 342:454, 2000.
13. Sonne MP, Scheede-Bergdahl C, Olsen DB, et al. Effects of physical training on endothelial function and limb blood flow in type 2 diabetes. *Appl Physiol Nutr Metab*. 32:936-941, 2007.
14. Goodfellow J, Bellamy M, Ramsey M, et al. Dietary supplementation with marine omega-3 fatty acids improve systemic large artery endothelial function in subjects with hypercholesterolemia. *JACC*. 35:265-270, 2000.
15. Cortes B, Nunez I, Cofan M, et al. Acute effects of high fat meals enriched with walnuts or olive oil on postprandial endothelial function. *JACC* 48:1666-1671, 2006.
16. Malkova D, Gill JM. Effects of exercise on postprandial lipoprotein metabolism. *Future Lipidology*. 1:743-755, 2006.
17. Schimmack G, DeFronzo RA, Musi N. AMP-activated protein kinase: role in metabolism and therapeutic implications. *Diabetes, Obes. Metab*. 8:591-602, 2006.
18. Fritz T, Kramer D, Karlsson H, et al. Low intensity exercise increases skeletal muscle protein expression of PPARδ and UCP3 in type 2 diabetic patients. *Diabetes/Metabolism Research and Reviews*. 22:492-498, 2006.
19. Narkar V, Evans R, et al. AMPK and PPARδ Agonists Are Exercise Mimetics. *Cell*. 134:405-415, 2008.
20. Muoio DM, Koves TR. Skeletal muscle adaptation to fatty acid depends on coordinated actions of the PPARs and PGC1α: implications for metabolic disease. *Appl Physiol Nut Metab*. 32:874-883, 2007.
21. Telford RD. Low physical activity and obesity: causes of chronic disease or simply predictors? *Med & Science in Sports & Ex*. 39:1233-1240, 2007.
22. Church T, LaMonte M, Barlow C, Blair SN. Cardiorespiratory fitness and body mass index as predictors of cardiovascular disease mortality among men with diabetes *Arch. Intern. Med*. 165:2114-2120, 2005.
23. Waller K, Kaprio J, Lehtovirta M, et al. Leisure-time physical activity and type 2 diabetes during a 28 year follow-up in twins. *Diabetologia*. Dec;53(12):2531-7, 2010.
24. Lopez-Soriano J. Chiellini C, Margherita M, et al. Roles of skeletal muscle and PPARs in the development and treatment of obesity. *Endocrine Reviews* 27:318–329, 2006.
25. Sinclair K, Bogart A, Buchwald D, et al. The prevalence of metabolic syndrome and associated risk factors in northern plains and southwest American Indians. *Diabetes Care* doi:10.2337/dc10-022, Sept 23, 2010
26. Trichopoulou A, Costacou T, Bamia C, Trichopoulos D. Adherence to a Mediterranean diet and survival in a Greek Population. *N Engl J Med*. 348:2599-608, 2003.



Firearm Mortality and Firearm Storage Practices in Western Alaska

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Introduction

Firearm injuries – associated with suicide, homicide, and unintentional acts – are a leading mechanism of fatal injury among Alaska Native people. During 2000 - 2006, 259 Alaska Native people died from firearm injuries, with a firearm mortality rate more than *three times* greater than the US All Races rate (32.3 vs. 10.2 per 100,000, respectively).[1] As shown in Table 1, most of the firearm deaths among Alaska Native people were suicide-related (75%). Conversely, 59% of the suicide deaths were associated with firearms. The suicide-by-firearm rate among Alaska Native people was four times greater than the rate for US All Races. The homicide-by-firearm rate is 1.5 times greater than the US All Races rate. Firearms were involved in 54% of all homicides among Alaska Native people. Only seven unintentional firearm deaths occurred between 2000 and 2006.[1]

"Limiting access to highly lethal means" is a strategy shown to reduce suicides from lethal pesticides, prescription medications, domestic gas, motor vehicle emissions, and other mechanisms.[2] The association between access to firearms and subsequent injury is documented in several studies.[3-8] In one large scale study, for example, locked firearms were associated with a 73% reduced risk of suicide for youths less than 20 years of age, compared to unlocked firearms. Similar protective associations were found for unloaded firearms.[9] A pilot project in southwest Alaska found that the percent of homes with all guns stored in a locked location was only 15%. While many free trigger locks had been distributed in the region, few homes used these devices to lock all of their guns. This was likely due to a difficulty in keeping track of all of the keys for owners with multiple guns. The project installed locking gun cabinets in twenty homes in two small communities. The pilot project increased the proportion of households with all firearms locked to 85% at three months post-intervention.[10]

The purpose of this study was to characterize firearm storage practices on a larger scale by interviewing heads of households in ten Alaska Native villages. The data gathered from this survey will also be used as a baseline for an intervention study. That study will install gun cabinets in village households and evaluate their effectiveness in improving firearm storage practices.

Methods

Survey sites and design. We conducted a cross-sectional household survey in ten randomly-selected villages in two remote regions of Alaska. Up to 35 households were randomly selected for participation from each village. All households were surveyed in villages with 35 or fewer households.

The organizations involved in the development and administration of the survey included the Yukon Kuskokwim Health Corporation (YKHC), the Bristol Bay Area Health Corporation (BBAHC), the Alaska Native Tribal Health Consortium (ANTHC) and the Harborview Injury Prevention and Research Center at the University of Washington (UW). The YKHC and the BBAHC provide medical, social, and public health services to over 30,000 Alaska Native people living in 84 villages in western and southwestern Alaska. Approval was obtained from the Alaska Area and the UW institutional review boards, from the Tribal Administration at YKHC and BBAHC, and from the Tribal Councils in each village.

The project employed a liaison selected by the Tribal Council in each village. Liaisons assisted in constructing a list of all households, traveled with survey staff to each household, and interpreted when needed. Verbal consent was obtained from an adult household member before the survey was administered.

Survey Participants. The survey team traveled to participating villages and each household was approached until an interview was completed, an adult head of household refused participation, or at least three attempts had been made to contact an eligible respondent. The 19-item survey did not ask for any identifying information, but did include

Table 1. Firearm deaths, Alaska Native people, 2000 - 2006

	Number of deaths	Percent of all firearm deaths	Alaska Native Rate per 100,000*	US All Races Rate per 100,000*	Ratio of rates: Alaska Native people to US All Races
Total firearm deaths	259	100%	32.3	10.2	3.2
Suicide by firearm	193	75%	24.1	5.8	4.2
Homicide by firearm	49	19%	6.2	4.0	1.6
Undetermined intent	8	3%	**		**
Unintentional	7	3%	**		**
Legal intervention	2	1%	**		**

*Age-adjusted rates.
**Small numbers make calculations unstable.

demographic data, the number and type of firearms in the home, the locked status of the firearms, ownership of trigger locks and gun cabinets, and if minors had access to the firearms. The survey team also directly observed the presence or absence of firearms in the household but did not handle any firearms.

Standard descriptive statistics were calculated. Due to the two-stage sampling design (samples of households were selected within a sample of villages), each household was weighted by the inverse of its probability of selection in order to obtain means and percentages that describe all households in the region. The data were analyzed with SAS software (Version 9.1 of the SAS System for Windows, Copyright 2002 - 2003 by SAS Institute Inc., Cary, NC, USA).

Results

A total of 318 households were approached by survey staff. Of these, 20 (6%) refused to participate and 23 (7%) were found to be vacant during the survey, and an adult respondent could not be located. We were unable to complete 14 (4%) surveys due to language or comprehension barriers and 3 (0.9%) others due to lack of knowledge or time. Surveys were completed in 258 households resulting in a response rate of 81%.

More than two-thirds of the respondents were male (67%), and the mean age of the respondent was 43.0 years (range 18 - 83) (Table 2). The mean household size was 4.4 persons (range 1 - 10). Almost three-quarters of the surveyed households reported having at least one child (less than 18 years of age) living in the home (n=178). The mean number of children per household surveyed was 2.1 (range 0 - 7).

The home survey format allowed the survey team to observe an unlocked gun when the respondent had reported safe-storage, but no instances of inconsistency were identified. This may be due to a general openness about firearm ownership in rural Alaska.

According to survey respondents, firearms were present in 76% of the surveyed households (N=197). The mean number of firearms per household was 5.5 (range 0 - 24). The mean number of rifles, shotguns, and handguns per household was 3.0, 2.0 and 0.5, respectively. Of the 197 households with firearms, 144 (73%) also had children in the home.

Twenty-six respondents (14%) reported having all firearms unloaded and locked (ideal firearm storage practice), 169 (85%) households reported having at least one firearm unlocked, and 10 (5%) households reported having at least one firearm loaded at the time of the survey (Table 2). The most common reasons reported for keeping a firearm loaded were for self defense, protection from wild animals, and to scare stray dogs. We found 11 (5%) households that had some type of lockable storage device (e.g., a gun safe or locked cabinet) for their firearms and 52 (29%) households that had at least one trigger lock.

Households with children reported the ideal firearm storage practice slightly more often than households without children (15% and 12%, respectively) (Table 3). Households with children were slightly less likely to own firearms, were more likely to own a trigger lock, but were no more likely to own a lockable storage device.

Discussion

As in many rural communities, multiple firearms are present in most rural Alaskan homes. Firearms are an essential part of the subsistence lifestyle of this population. They are used to hunt large animals (such as caribou, bears, and muskoxen) and waterfowl for food, clothing, and handicrafts. Firearms are also used for protection against wildlife that can pose a threat to human life, such as bears and moose; to mark

Table 2. Characteristics of respondents and households, firearm storage practices survey

Characteristic	Sample n	Sample %	Weighted %
Adult respondent	258	100%	
Gender			
Male	172	68%	67%
Female	80	32%	33%
Unknown	6		
Children living in the home	178	69%	73%
Households with firearms present*	196	76%	76%
Firearm type			
Handgun	51	27%	24%
Shotgun	168	88%	89%
Rifle	179	93%	92%
Firearm storage practices*			
All guns unloaded and locked	26	13%	14%
At least one gun unlocked	169	86%	85%
At least one gun loaded	10	5%	5%
Owned at least one trigger lock	52	27%	29%
Owned a gun cabinet or gun safe	11	6%	5%

* Includes all households reporting at least one firearm.

celebratory occasions; and to welcome people home after long absences from their communities.

In Alaskan villages, extended families are common, so many people come and go out of homes and therefore have access to firearms. Traditionally, guns are stored on gun racks in the home. The racks keep the firearms out of reach of young children, but they are accessible to older youths.

Successful strategies to limit access of firearms include gun ownership laws[11,12], trigger locks, gun safes[10], and education by providers about the importance of safe storage for families with at risk youth.[13] In Alaska, legislation limiting gun ownership is not feasible or culturally appropriate.

We found that gun ownership is common among households in western and southwestern Alaska, but safe firearm storage is rare. The abundance of guns found in this survey is consistent with the results from a previous pilot project in southwestern Alaska.[10] National estimates have found that one in three US households has firearms[14-16], but the proportion of households with firearms has been found to be higher in Alaska[14] and in rural areas.[17-22] One study found that 22% of homes with firearms reported that all firearms were unloaded and locked[23], as compared to 14% of the households in this survey. Our results also show that in western and southwestern Alaska, ownership of long guns is more common than handguns. The lower proportion of guns in safe storage may reflect the difficulty of properly storing larger firearms and the difficulty in obtaining a locking gun cabinet in remote regions of Alaska.

Although households with children were slightly less likely to have firearms than households without children, this does not imply that children have limited access to firearms. Alaskan villages are often made up of large extended families, so it is common for nearly every home in a village to be regularly visited by children of all ages.

Households were more likely to own a trigger or cable lock than a lockable cabinet for firearm storage (29% and 5%, respectively). Nonetheless, a previous pilot project found that gun owners in rural Alaska preferred a lockable cabinet to trigger locks and that trigger locks were less often used than gun cabinets [10].

Two villages were excluded from our sample due to excessive travel costs, which may have led to

Table 3. Firearm storage practices, households without and with children

	Households without children (N=53)	Households with children (N=143)
With any firearm loaded and unlocked	4.2%	2.1%
With all firearms unloaded and locked	12.4%	14.4%
With lockable storage for firearms	4.1%	5.6%
With trigger or cable locks	18.4%	32.8%

underrepresentation of the regions' more remote villages. In addition, the 23 vacant households for which no survey data were collected may have differed from the households that were occupied at the time of our visit.

It is possible that some respondents were not truthful about how their firearms were stored at the time of the survey, particularly because the survey administrator was an employee of a tribal health organization. Therefore, the actual proportion of unloaded and locked firearms may be artificially high. We did not anticipate that a high proportion of households would own trigger locks (26%), so we did not ask about their use and thus could not quantify the number of firearms with these devices. Finally, female respondents made up 33% of the respondents. At least one study has found that females may underreport the number of firearms in the home.[24]

The availability of gun lockers is increasing in rural communities through injury prevention interventions by tribal health organizations in collaboration with regional housing authorities. Education about the importance of safe storage of guns to parents of youths at risk of suicide should also be a component of the firearm and suicide prevention strategy. Safe storage education by physicians to these parents during emergency room visits is a teachable moment and has proven effective.[13] This education may be especially important for families in rural communities with large numbers of firearms.

Several strategies have been proven effective in reducing suicide rates.[2] They can be categorized as prevention, intervention, or postvention activities. One successful primary prevention strategy is the teaching of curricula to adolescents that focus on enhancing problem solving skills and resiliency. Also, restricting access to firearms and other lethal means has reduced suicide rates among many populations. Successful intervention strategies include those strategies that intercede before suicidal thoughts become actions. Gatekeeper education programs, such as the Applied Suicide Intervention Skills Training (ASIST), have successfully trained various groups on how to identify at-risk individuals and refer them to resources.[2] Between October 2008 and April 2010, ASIST has been taught to approximately 500 participants who work with Alaska Native people. Another successful intervention strategy is physician education about suicide risk and depression, as well as systematic screening for depression in hospital and clinic settings. Successful postvention strategies prevent further loss of life or harm after a suicide or suicide attempt. Multidisciplinary follow up care of patients following attempts, and media guidelines for the reporting of suicide have been shown to prevent further loss of life.[2]

Providers can counsel families of adolescents with suicidal ideation that it is imperative to find a locker or other safe location for storage of all of their guns as well as any other potentially lethal means, such as medications. Future collaboration between providers and injury prevention practitioners on a safe firearm storage initiative in both the community settings and the clinic settings could lead to a successful reduction in firearm injury.

This survey is part of a larger injury prevention project being conducted by BBAHC, YKHC, ANTHC and the UW that is installing gun cabinets and providing education about safe firearm storage. Project partners are actively pursuing the promotion of safe firearm storage with the expectation that it will reduce rates of firearm injury.

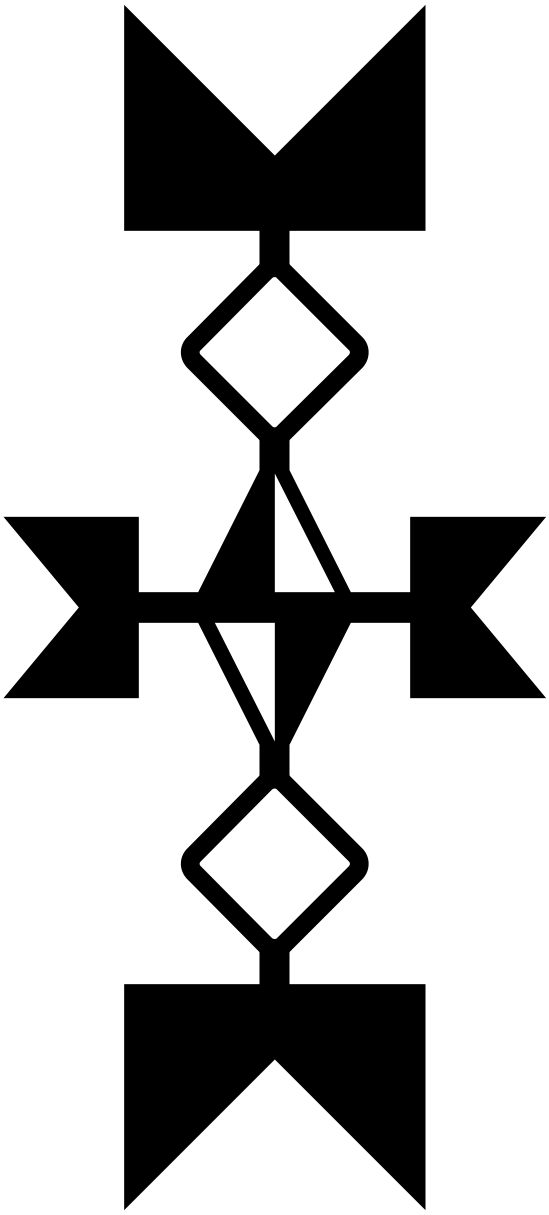
Acknowledgements

The authors would like to thank Nancy Bill and the Indian Health Service for their support of this research project. The authors would also like to thank the residents of the Yukon Kuskokwim Delta and Bristol Bay regions of Alaska for their support and collaboration during this research project.

References

1. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. [database on the Internet]. Centers for Disease Control and Prevention. 2005 [cited 04/09/08]. Available from *www.cdc.gov/ncipc/wisqars*.
2. Mann J, Apter A, Bertolote J, et al. Suicide prevention strategies: A systematic review. *JAMA*. 2005;294(16):2064-2074.
3. Brent D. The presence and accessibility of firearms in the homes of adolescent suicides - A case-control study. *JAMA*. 1991;266:2989-95.
4. Cherry D, Runyan C, Butts J. A population based

study of unintentional firearm fatalities. *Inj Prev*. 2001 2001;7:62-5.
5. Grossman D. Self-inflicted and unintentional firearm injuries among children and adolescents - The source of the firearm. *Arch Pediatr Adolesc Med*. 1999;153:875-8.
6. Kellermann A. Suicide in the home in relation to gun ownership. *N Engl J Med*. 1992;327:467-72.
7. Kellermann A. Injuries due to firearms in three cities. *N Engl J Med*. 1996;335:1438-44.
8. Shah S. Adolescent suicide and household access to firearms in Colorado: Results of a case-control study. *J Adolesc Health*. 2000;26:157-63.
9. Grossman D. Gun storage practices and risk of youth suicide and unintentional firearm injuries. *JAMA*. 2005;293:707-14.
10. Horn A. Community based program to improve firearm storage practices in rural Alaska. *Inj Prev*. 2003;9:231-4.
11. Carrington PJ, Moyer S. Gun control and suicide in Ontario. *Am J Psychiatry*. 1994:151:4: 606-608.
12. Brigham G. Lethal means restriction: Its value and its problems [online]. Presented at the US Public Health Service Conference, 2003. Available from *http://www.sprc.org/featured_resources/trainingandevents/conferences/co/pdf/lethalmeans.pdf*
13. Kruesi M, Grossman J, Pennington J, et al. Suicide and violence prevention: parent education in the emergency department. *J Am Acad Child Adolesc Psychiatry*. 1999;38:250-256
14. Okoro C. Prevalence of household firearms and firearm-storage practices in the 50 states and the District of Columbia: Findings from the behavioral risk factor surveillance system, 2002. *Pediatrics*. 2005;116:e370-E6.
15. Stennies G. Firearm storage practices and children in the home, United States, 1994. *Arch Pediatr Adolesc Med*. 1999;153:586-90.
16. Teret S. Support for new policies to regulate firearms. *N Engl J Med*. 1998;339:813-8.
17. Chatterjee B. Firearms prevalence and storage practices in Wisconsin households. *Wisconsin Medical Journal*. 1996;95:286-91.
18. Forjuoh SN, Coben JH, Dearwater SR. Firearm ownership and storage practices in Pennsylvania homes. *Inj Prev*. 1996;2:278-82.
19. Nelson D. Population estimates of household firearm storage practices and firearm carrying in Oregon (vol 265, pg 1744, 1996). *JAMA*. 1998;279:510.
20. Nordstrom DL, Zwerling C, Stromquist AM, et al. Rural population survey of behavioral and demographic risk factors for loaded firearms. *Inj Prev*. 2001 2001;7:112-6.
21. Wiktor S. Firearms In New Mexico. *West J Med*. 1994;161:137-9.
22. Zwerling C. Risk factors for injury in rural Iowa - Round one of the Keokuk County Rural Health Study. *Am J Prev Med*. 2001;20:230-3.
23. Connor S. The association between presence of children in the home and firearm-ownership and storage practices. *Pediatrics*. 2005;115:E38-E43.
24. Knight-Bohnhoff K, Harris MB. Parent's behaviors, knowledge, and beliefs related to unintentional firearm injuries among children and youth in the southwest. *J Pediatr Health Care*. 1998;12:139-46.



SAVE THE DATE

*** Challenges in Indian Health Care ***

*** Health Care Budgets & Financing ***

*** Data and Information Technology ***

*** Law ***

*** Integrity and Ethics ***

*** Negotiation ***

Session One: April 11-15, 2011

Session Two: May 16-20, 2011

Session Three: June 6-10, 2011

You can be a part of the 2011 Class of the Executive Leadership Development Program (ELDP)!

The purpose of the Executive Leadership Development Program is to provide a forum where participants learn new skills and encounter different approaches to reduce barriers, increase innovation, ensure a better flow of information and ideas, and lead change. The goal is to provide essential leadership training and support for Indian health care executives, whether they work in Federal, tribal, or urban settings.

Look for the registration material in January on *http://www.ihs.gov/nonmedicalprograms/eldp/* .

ELDP Coordinators:

gigi.holmes@ihs.gov* and *wesley.picciotti@ihs.gov

This is a page for sharing "what works" as seen in the published literature, as well as what is being done at sites that care for American Indian/Alaskan Native children. If you have any suggestions, comments, or questions, please contact Steve Holve, MD, Chief Clinical Consultant in Pediatrics at sholve@tcimc.ihs.gov.

IHS Child Health Notes

Quote of the month

"We can have concentrated wealth in the hands of a few or we can have democracy, but we can't have both."

Louis Brandies, Supreme Court Justice

Article of Interest

FDA says Tessalon® liquid cough capsules pose risk for young children. The medication has candy-like appearance; it should be kept in child-proof containers.

Tessalon®, approved by the FDA to provide symptomatic relief of cough in patients older than ten, may attract younger children because of the drug's candy-like appearance – a round, liquid-filled gelatin capsule. The safety and effectiveness of benzonatate in children younger than ten years has not been established.

"Benzonatate should be kept in a child-resistant container and stored out of reach of children," said Carol Holquist, RPh, director of the FDA's Division of Medication Error Prevention and Analysis. "The FDA encourages health care professionals to talk with their patients and those caring for children about the risk of accidental ingestion or overdose."

A review of the FDA's Adverse Event Reporting System database from 1982 through May 2010 identified seven cases of accidental ingestion associated with benzonatate in children younger than ten. Five of the cases resulted in death in children ages two years and younger. Overdose with benzonatate in children younger than two years has been reported following accidental ingestion of only one or two benzonatate capsules.

Common adverse events reported in the overdose cases included cardiac arrest, coma, and convulsion. Signs and symptoms of overdose can occur within 15 - 20 minutes of ingestion. Some of the deaths reported in children have been within hours of the accidental ingestion.

The FDA is also adding a new Warning and Precaution section to the benzonatate drug label to warn health care professionals about accidental ingestion resulting in overdose and death in children younger than ten.

Consumers and health care professionals are encouraged to report adverse side effects or medication errors from the use of benzonatate to the FDA's MedWatch Adverse Event Reporting program at *www.fda.gov/MedWatch* or by calling (800) 332-1088.

For additional information, go to *http://www.fda.gov/Drugs/DrugSafety/ucm236651.htm*

Editorial Comment

Respiratory season with influenza and RSV is coming soon. This report on Tessalon® capsules demonstrates that sometimes nothing is better than something with potentially lethal side effects. It would be important for you to share this with colleagues who work in the ED so they don't inappropriately prescribe Tessalon® and to assure that they are aware of the potential for toxicity.

Recent literature on American Indian/Alaska Native Health

Jeff Powell, MD, MPH

Childhood obesity, other cardiovascular risk factors, and premature death. *NEJM*. 2010; 362:485-93

This month's article is from the February 2010 edition of the *New England Journal of Medicine*. The article provides details on the relationship between childhood obesity and premature death (death before 55 years of age) in Pima or Tohono O'odham Indian participants. The study is important because it clearly demonstrates the health consequences of childhood obesity. This adds to the current body of literature on the subject of childhood obesity and health consequences. Provided at the end of this review are references for two articles focusing on obesity disparities. In light of these disparities, the findings of this month's study become even more striking.

In the February 2010 article, Franks and colleagues analyze data from a very large prospective cohort study, taking place within a specific geographic portion of the Gila River community. In total, more than 4800 children and adolescents five to 19 years of age, born between 1945 and 1984, were included. This study describes the analysis of anthropometric (BMI) data as well as other common chronic disease risk markers that are identified in children. In addition to BMI, the study also specifically analyzed blood glucose intolerance, blood pressures, and cholesterol levels. The team then followed the cohorts of enrolled children to evaluate for premature death. Participants were followed with research examinations until age 55 or year 2003. Cause of death was determined based on death certificates. The analyses separated causes of death by exogenous causes (such as injury incidents

and homicide) and endogenous causes (illness or self inflicted injury). More detailed analysis by specific causes or smaller categories were not conducted due to the lack of study power for more detailed analyses.

The characteristics of the study cohort are as follows (shown in Table 1). Mean age at enrollment was 11.3 (43 percent of the cohort were in the youngest ages 5 - 9 years). Almost 29 percent of enrolled youth were obese (BMI over 95%ile for age). Participants were followed a median of almost 24 years, with a range of follow up of a few days to 38 years. Children who were diagnosed with diabetes or found by the study to have diabetes at time of enrollment were excluded. Children who went on to develop diabetes remained in the study analyses.

The core findings are presented graphically in Figure 1, and in table format in Table 3. To summarize, the study found that the heaviest quartile of children enrolled in the study were 2.3 times more likely to die prematurely of endogenous causes (including self inflicted injury) compared with the thinnest quartile of children. Impairment of blood glucose at study enrollment imparted a 1.7 fold increase in the incidence rate ratio (IRR). Interestingly, blood pressure (as a continuous variable) and total cholesterol were not found to independently correlate with increased premature death.

Figure 1 provides additional insight into this study's findings. This shows the Kaplan–Meier Curves for Premature Death for three distinct age categories: 5 through 9 years of age, 10 to less than 15 years, and 15 through 19 years. What I find striking is the accelerated increase in premature death for the study participants in the heaviest BMI quartile when they were ages 5 though 9 years. This youngest cohort had not yet reached age 55 years in 2003, and the increase in premature death was occurring between the ages of 30 and mid-40s. The older cohorts, in comparison, show accelerated premature death between the ages of 40 and 55. While it is noted that this youngest cohort contained youth with higher BMI z scores than the older cohorts, the article does not offer explanation or insights into the differences in the Premature Death curves between age cohorts.

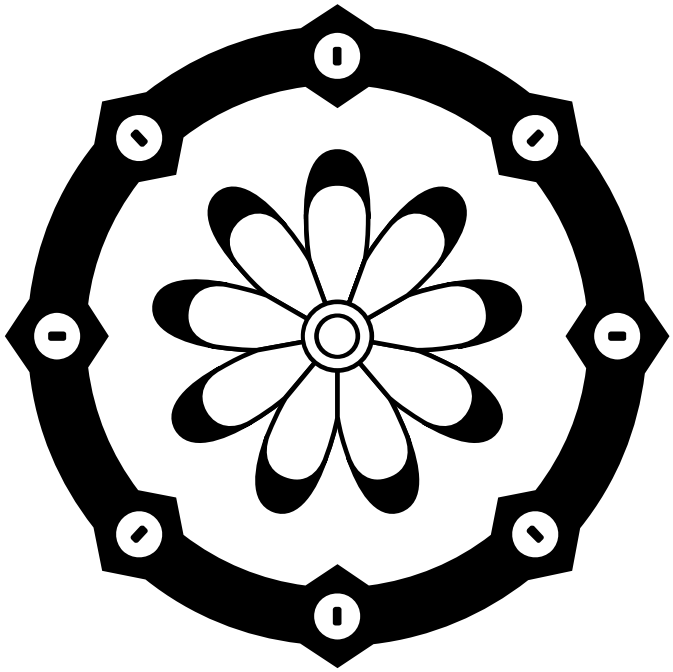
The article discussion provides many insights into the implications of this research and offers considerations for future research. For example, the relationship between diabetes incidence and premature death is further considered. The implications of the lack of correlation between total cholesterol and premature death were also considered. The authors point out that it is quite possible that HDL represents a more predictive marker in this Native American population. How much this study may be generalized to other populations is a fascinating consideration. On the one hand, this cohort represents a distinct population of Native American children, who may have specific environmental and genetic characteristics not shared by other communities. On the other hand, this study represents the most robust analysis of any community with nearly 30% rates of obesity – rates that have now become common in many subpopulations of children in the US and abroad. It is possible that this study provides a lens on what may the implications of high obesity rates may be for these other communities in 30 years.

In conclusion, this study provides an important addition to our understanding of childhood obesity and its health implications among American Indian and Alaska Native children.

The following are two interesting articles specific to disparities in rates of childhood obesity – both showing that disparities in AI/AN youth are severe, and may be worsening.

Rising social inequalities in US childhood obesity, 2003–2007. *Annals of Epidemiology*. 2010;20:40-52.

Disparities in peaks, plateaus, and declines in prevalence of high BMI among adolescents. *Pediatrics*. 2010;126:434-442.



MEETINGS OF INTEREST

Advancements in Diabetes Seminars
Monthly; WebEx

Join us monthly for a series of one-hour WebEx seminars for health care program professionals who work with patients who have diabetes or are at risk for diabetes. Presented by experts in the field, these seminars will discuss what's new, update your knowledge and skills, and describe practical tools you can use to improve the care for people with diabetes. No registration is necessary. The accredited sponsors are the IHS Clinical Support Center and IHS Nutrition and Dietetics Training Program.

For information on upcoming seminars and/or previous seminars, including the recordings and handouts, click on this link and see Diabetes Seminar Resources: *http://www.diabetes.ihs.gov/index.cfm?module=trainingSeminars*

Available EHR Courses

EHR is the Indian Health Service's Electronic Health Record software that is based on the Resource and Patient Management System (RPMS) clinical information system. For more information about any of these courses described below, please visit the EHR website at *http://www.ihs.gov/CIO/EHR/index.cfm?module=rpms_ehr_training*. To see registration information for any of these courses, go to *http://www.ihs.gov/Cio/RPMS/index.cfm?module=Training&option=index*.

The 16th Annual Elders Issue

The May 2011 issue of THE IHS PROVIDER, to be published on the occasion of National Older Americans Month, will be the sixteenth annual issue dedicated to our elders. Indian Health Service, tribal, and Urban Program professionals are encouraged to submit articles for this issue on elders and their health and health care. We are also interested in articles written by Indian elders themselves giving their perspective on health and health care issues. Inquiries or submissions can be addressed to the attention of the editor at the address on the back page of this issue.

Honor our children.

Give them a healthy smile.

Make an appointment for yourself to protect your baby's teeth.

February is Children's Dental Health Month

Albuquerque Area
Dental Support Center
A program of

Healthy Families • Strong Communities
NAPPR, Inc.

POSITION VACANCIES

Editor's note: As a service to our readers, THE IHS PROVIDER will publish notices of clinical positions available. Indian health program employers should send brief announcements as attachments by e-mail to john.saari@ihs.gov. Please include an e-mail address in the item so that there is a contact for the announcement. If there is more than one position, please combine them into one announcement per location. Submissions will be run for four months and then will be dropped, without notification,, but may be renewed as many times as necessary. Tribal organizations that have taken their tribal "shares" of the CSC budget will need to reimburse CSC for the expense of this service ($100 for four months). The Indian Health Service assumes no responsibility for the accuracy of the information in such announcements.

Family Medicine, Internal Medicine, Emergency Medicine Physicians
Family/Pediatric Nurse Practitioner for School Health Program
Family Nurse Practitioner for Sells Indian Hospital
Sells Service Unit; Sells, Arizona

The Sells Service Unit (SSU) in southern Arizona is recruiting for board certified/board eligible emergency room physician to join our experienced medical staff. The Sells Service Unit is the primary source of health care for approximately 24,000 people of the Tohono O'odham Nation. The service unit consists of a Joint Commission accredited 34-bed hospital in Sells, Arizona and three health centers: San Xavier Health Center, located in Tucson, Arizona, the Santa Rosa Health Center, located in Santa Rosa, Arizona, and the San Simon Health Center located in San Simon, Arizona, with a combined caseload of approximately 100,000 outpatient visits annually. Clinical services include family medicine, pediatrics, internal medicine, prenatal and women's health care, dental, optometry, ophthalmology, podiatry, physical therapy, nutrition and dietetics, social work services, and diabetes self-management education.

Sixty miles east of the Sells Hospital by paved highway lies Tucson, Arizona's second largest metropolitan area, and home to nearly 750,000. Tucson, or "The Old Pueblo," is one of the oldest continuously inhabited sites in North America, steeped in a rich heritage of Indian and Spanish influence. It affords all of southern Arizona's limitless entertainment, recreation, shopping, and cultural opportunities. The area is a favored tourist and retirement center, boasting sunbelt attributes and low humidity, with effortless access to Old Mexico, pine forests, snow sports, and endless sightseeing opportunities . . . all within a setting of natural splendor.

We offer competitive salary, relocation/recruitment/retention allowance, federal employment benefits package, CME leave and allowance, and loan repayment. For more information, please contact Peter Ziegler, MD, SSU Clinical Director at (520) 383-7211 or by e-mail at *Peter.Ziegler@ihs.gov*. (1/11)

Mid-Level Practitioner
Pediatrician
St. Regis Mohawk Health Service; Akwesasne, New York

The St. Regis Mohawk Tribal Health Service is looking for a mid-level practitioner and a pediatrician to work in our general practice clinic. We are located in Akwesasne, New York, and we are uniquely situated in northeastern upstate New York. Split right down the middle by the Canadian border, we are in the northern foothills of the Adirondack Mountains and along the beautiful and historic St. Lawrence River. We are 90 miles from both Montreal, Quebec, and Ottawa, Ontario (about 5½ hours north of New York City).

Our Medical Clinic operates Monday to Friday, 8:00 am to 5:00 pm, and is staffed by a board certified internist, a board certified family practitioner, and an experienced family nurse practitioner. We have an Outreach Program staffed by a family nurse practitioner and two registered nurses and two licensed practical nurses. There are also mental health, alcohol and chemical dependency, nutrition/WIC; dental, pharmacy, ane certified laboratory services.

We are a congenial staff who work hard and like to laugh. We provide excellent medical care to our appreciative patients. If you are interested, please contact Debra Martin, Health Director, St. Regis Mohawk Health Service, 412 State Route 37, Akwesasne, New York 13655; telephone (518) 358-3141, Ext. 103. (12/10)

Family Practice Physician
Family Nurse Practitioner
Physician Assistant
Psychiatrist
Bay Mills Health Center/Bay Mills Indian Community; Brimley Michigan

The Bay Mills Health Center is seeking a family practice physician (MD or DO; board certified). Must have completed a residency program and have a Michigan license or be able to obtain one. New Graduates are welcome to apply!

We are seeking a full time psychiatrist who is board certified, able to obtain a Michigan license and has completed a residency program. The primary focus is on the adult population with some children in the patient case load.

We are in need of a certified mid-level practitioner, a FNP or a PA, with a background in Family Practice.

The health center is located in the beautiful eastern Upper Peninsula of Michigan on the Bay Mills Indian Reservation.

We are located on the shores of Lake Superior, bordering Canada and we are rich in culture. The area is the outdoor enthusiast's dream.

We are an outpatient facility open 8 am to 4:30 pm, M-F. We have onsite lab, pharmacy, x-ray, behavioral health, dental, community health, and social service departments. Physicians carry a patient load averaging between 15 - 20 patients a day, with adequate time to be aclimated to the facility and procedures. There are no on call and weekend duties.

The Bay Mills Health Center was established in 1976 and is a Federally Qualified Health Center. The center is open to the general public and is Joint Commission accredited. Our patient focus is geared toward prevention. We are striving to become a patient-centered medical home, and plan to collaborate with Michigan State University to host residents during rotations.

We offer a competitive salary, student loan repayment options,, CME leave and allowance, and benefits. If you are interested, please contact Audrey Breakie at (906) 248-8327 (day) or (906) 437-5557 (evenings); or e-mail *abreakie@baymills.org*. (12/10)

Medical Director
Emergency Room Physicians
Emergency Medicine PA-Cs/Nurse Practitioners
Family Practice PA-Cs/Family Nurse Practitioners
OB/GYN Physician
Nurse Mid-Wives
Family Practice Physicians
Rosebud Comprehensive Health Care Facility; Rosebud, South Dakota

The Rosebud Comprehensive Health Care Facility in Rosebud, South Dakota is seeking board eligible/board certified physicians and mid-levels with at least 2 - 3 years post-residency experience. We are also in need of ER PA-Cs, family practice PA-Cs, and family nurse practitioners. Rosebud is located in rural south central South Dakota, west of the Missouri River on the Rosebud Indian Reservation and is approximately 30 miles from the Nebraska border. We are a 35-bed facility that has a 24-hour emergency department, and a busy clinic that offers the following services: family practice, internal medicine, ob/gyn, pediatrics, general surgery, optometry, dentistry, physical therapy, dietary counseling, and behavioral health. Our staff is devoted to providing quality patient care, and we have several medical staff members who have been employed here ten or more years. The beautiful Black Hills, Badlands, Custer State Park, Mount Rushmore, and Crazy Horse Memorial are just 2 - 3 hours away. South Dakota is an outdoorsman's paradise with plenty of sites for skiing, hiking, hunting, fishing, boating, and horseback riding. Steeped in western folklore, Lakota cultural history, and the lands of such famous movies as "Dances with Wolves" and "Into the West," there is plenty for the history buff to explore. If you are interested in applying for a position, please contact Kevin Stiffarm, Chief Executive Officer, at (605) 747-3111, (605) 517-1283; or e-mail him at *kevin.stiffarm@ihs.gov*. (11/10)

Family Practice Physician
Warm Springs Health and Wellness Center; Warm Springs, Oregon

The Warm Springs Health and Wellness Center has an opening for a board certified/eligible family physician. Located in the high desert of central Oregon, we have a clinic that we are very proud of and a local community that has much to offer in recreational opportunities and livability. Our facility has been known for innovation and providing high quality care and has received numerous awards over the past ten years. We have positions for five family physicians, one created by a physician who recently retired after 27 years of service. Our remaining four doctors have a combined 62 years of experience in Warm Springs. This makes us one of the most stable physician staffs in IHS. Our clinic primarily serves the Confederate Tribes of Warm Springs. We have a moderately busy outpatient practice with our doctors seeing about 15 - 18 patients per day under an open access appointment system. We were a pilot site for the IHS Innovations in Planned Care (IPC) project and continue to make advances in how we provide care to our patients. We fully utilize the IHS-Electronic Health Record, having been an alpha test site for the program when it was created. We provide hospital care, including obstetrics and a small nursing home practice, at Mountain View Hospital, a community hospital in Madras, Oregon. Our call averages 1 in 5 when fully staffed. For more information, please call our Clinical Director, Miles Rudd, MD, at (541) 553-1196, ext 4626, or e-mail *stephen.rudd@ihs.gov*. (10/10)

Licensed Clinical Social Worker
Family Practice Physician
Consolidated Tribal Health Project; Redwood Valley, California

The Consolidated Tribal Health Project in Redwood Valley, California is recruiting for a dentist and a family practice physician. These positions are full-time with benefits; salary DOE. All applicants will be considered; Native American preference applies. Visit *www.cthp.org* for an application and job description. Send application and resume to HR Department by fax at (707) 485-7837. ADA/EEO. (1/11)

Family Practice Physician
Menominee Tribal Clinic; Keshena, Wisconsin

Join seven experienced primary care physicians in beautiful north central Wisconsin 45 miles from Green Bay. We provide comprehensive primary care for Wisconsin's longest residing residents at a large, established clinic on the banks of the Wolf River. Practice in an efficient setting with committed colleagues, your own nurse, and a robust electronic

health record. Inpatient and obstetrical care are provided at a 25-bed community hospital nine miles away, where family doctors do C-sections, colonoscopies, and EGDs. Live in a safe town of 8000 with great schools and endless recreational opportunities. Competitive compensation available, along with loan repayment (NHSC and State of Wisconsin). Contact Kevin Culhane, MD at (715) 799-5786, or e-mail at *kevinc@mtclinic.net*. (10/10)

Community Dietitian
Southeast Alaska Regional Health Consortium (SEARHC); Juneau, Alaska

SEARHC invites registered dietitians to apply for a community dietitian opening on the SEARHC Health Promotion Team. The baseline qualifications are a BS in community nutrition/dietetics or a nutrition-related field. Two years clinical nutrition and/or community nutrition work experience are required, with specific experience in management and prevention of diabetes, heart disease, and other chronic diseases. Must be a registered dietitian and eligible for dietetic licensure in the State of Alaska.

The dietitian will assess, plan, implement, and evaluate community nutrition programming focused on diabetes prevention. Additionally, the community dietitian offers medical nutrition therapy to clients living with diabetes and pre-diabetes on an on-site, outpatient basis as well as using distance delivery via Polycom. These services are provided to individuals, small groups, and communities in Juneau and the northern SEARHC region. SEARHC is a non-profit tribal health consortium of 18 Native communities, which serves the health interests of the Tlingit, Haida, Tsimshian, and other Native people of southeast Alaska. Residents of southeast Alaska towns share a strong sense of community. Residents take full advantage of the excellent opportunities for fishing, boating, skiing, hiking, and other outdoor activities. Applications are available on-line at *www.searhc.org*, or please contact Human Resources at (907) 463-6693. (10/10)

Family Practice Physician
Western Oregon Service Unit (Chemawa); Salem, Oregon.

The Western Oregon Service Unit is a comprehensive ambulatory care facility located on the campus of the BIA's Chemawa Indian Boarding School. Chemawa serves not only the 420 high school teens who come to the boarding school every fall, but urban and regional beneficiaries as well.

Staffed with two family practice physicians and one family nurse practitioner, Chemawa is currently recruiting for a board certified/board eligible family medicine physician. If selected for the position, you would have a federal position, competitive salary, the absence of call, and have week-ends, holidays, and nights free to enjoy the urban lifestyle of Oregon's state capitol, Salem. Salem has moderate weather and easy access to the Pacific Ocean, the Cascade Mountains, the high desert, Portland, and the renowned viticulture of the Willamette Valley.

For more information, contact CAPT Les Dye at *leslie.dye@ihs.gov*. (9/10)

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