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The Elder Care Initiative Program Has Moved to Zuni

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Editor's note: This May issue of* The IHS Provider, *published on the occasion of National Older Americans Month, is the third annual issue dedicated to our elders. Indian Health Service, Tribal, and Urban Program professionals are encouraged to consider submitting articles for the May 1999 issue on elders. We are also interested in articles written by Indian elders themselves giving their perspective on health care issues. Inquiries can be addressed to the attention of the editors at the address on the back page of this issue.

As many of you know, Dr. Patrick Stenger, who led the IHS Elder Care Initiative program since January 1996, passed away in March of this year. His leadership in bringing the IHS Director's Elder Initiative from a statement of vision to a working program was invaluable.

In February, 1998, this program was moved to the Zuni-Ramah Service Unit of the Albuquerque Area. There it will be coordinated by Robin Miller, RN, CS and Bruce Finke, MD. Ms. Miller is a Clinical Nurse Specialist in geriatrics and serves as the Staff Educator at Zuni. Dr. Finke is a Family Physician with a Certificate of Added Qualification in Geriatrics and has served as co-chair of the Albuquerque Area Elder Care Workgroup. Both Ms. Miller and Dr. Finke will continue in their clinical roles as they take on this new program.

The past few months have been a period of transition for the program. It has been an opportunity to reexamine strategies and refocus the priorities of the program (see sidebar, page 50).

The goal of the Elder Care Initiative is to support the development of high quality services for American Indian and Alaska Native elders by acting as a consultation and liaison resource for IHS, Tribal, and Urban (I/T/U) Programs. This means fostering the development of new and innovative programs, the adaptation of established models to meet local needs and conditions, and the dissemination of existing successful approaches.

The Elder Care Initiative currently has no funds for program development, but we can achieve our goal by collaborating with the many creative and dedicated people working in the field. There are a great many interesting programs already in place.

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These can be shared and modified as needed. There are many people asking the same questions all over Indian Country. If these people are connected with each other, they can work together to find answers. There is money available through private foundations for issues of concern for Indian elders. If we can identify those funding opportunities and share that information with those in the field who see the need on a daily basis, we will see new solutions created.

This approach has informed our priorities. We are working to establish a resource network of personnel in I/T/U programs with skills and interest in geriatrics, and to establish relationships with sources of outside funding and expertise. We hope to connect people with people, and programs with resources.

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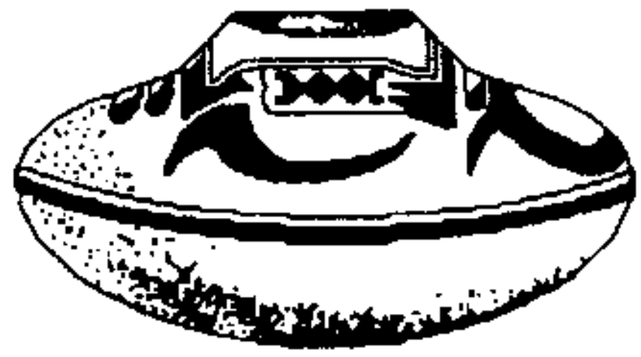
Call, fax, or e-mail us with your ideas, questions, and suggestions. Together we will bring the best to the elders we care for. □



Current Priorities of the Elder Care Initiative

- Develop and make available to IHS, Tribal, and Urban Programs a tool for a comprehensive, functionally oriented elder exam that can be used in the usual outpatient setting.
- Support the implementation of the Swing Bed Pilot Programs and the ongoing evaluation process. Support the development of additional swing bed sites if warranted by evaluation of the model programs.
- Identify IHS/Tribal/Urban Program personnel willing to serve as geriatric resource personnel and to lead efforts to increase quality of care for elders.
- Identify clinically relevant outcome measures for tracking elder care at local and national levels.
- Identify outside funding sources for program development.
- Identify training resources in geriatrics for IHS/Tribal/Urban Program personnel.
- Develop relationships with outside agencies with interest in American Indian and Alaska Native elders (academic centers, governmental agencies, private foundations and advocacy groups).
- Facilitate elder program development at local IHS/Tribal/Urban Program sites. □

Diabetes Mellitus in Elders

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Introduction

In recent years, diabetes mellitus has become more prevalent among American Indian and Alaska Native elders, and consequently has resulted in increasing morbidity and mortality in this age group. Are there reasons for the rising prevalence of diabetes in American Indian and Alaska Native elders? Are there guidelines for effective management of diabetes in elders? More importantly, can quantity and quality of life be maintained or improved for the elder who has diabetes? As pediatricians have long contended that children are not just "little adults," it should be similarly recognized that elders are not just "older adults," but are also *special* adults with *special care needs*. This article will explore some of these issues in the context of diabetes.

"Diabetes mellitus is defined as a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels."[1] Thus, by definition, diabetes mellitus is a chronic, degenerative, disabling, debilitating disease, manifested by a high blood sugar. There is presently no known cure for diabetes, although effective management tools exist.

In the American Indian and Alaska Native population, virtually all cases of diabetes, even those in children, are type 2 (most other ethnic groups usually manifest 10-15% type 1 and 85-90% type 2, whereas American Indians and Alaska Natives have over 98% type 2, with type 1 diabetes being rare). Type 2 diabetes is characterized by insulin resistance, and generally has its highest incidence after age 40 years.

Of the $46 billion spent annually on medical care for diabetes in the United States, over 60% is spent on persons age 65 years or older,[13] the "Medicare years." Generally, diabetes is about three times as prevalent after the age of 65 as it is in the general population.[17] As it becomes more obvious in the health care industry that preventive care is cost-effective in chronic disease states,[3,4] Medicare is establishing criteria and components for diabetes management, which relate to the American Diabetes Association's standards.[9,10,12] Because of the slow, insidious onset of this disease, about one third to one half of all individuals with type 2 diabetes will be unrecognized, undiagnosed, and possibly without symptoms.[1,15] With the change in the criteria and methodology for diagnosing diabetes (use of fasting blood sugar values rather than routine employment of a glucose tolerance test),[1] it is possible that even more individuals will be diagnosed with diabetes. Also, the addition of new criteria for individuals with impaired fasting glucose (see Table 1) adds a new risk group to those who should receive routine, periodic screening, testing, surveillance, and risk factor intervention.[13]

Table 1. American Diabetes Association Criteria for Diagnosis of Diabetes, 1997.[1]

Diagnosis	Fasting blood sugar (FBS)
Diabetes	126 mg/dl or higher
Impaired fasting glucose	110-125 mg/dl
Diagnosis	**2 hour value after 75 grams of oral glucose**
Diabetes	200 mg/dl or higher
Impaired glucose tolerance	140-199 mg/dl

Pathophysiology in the Elderly

Hyperglycemia is seen with increasing frequency in the elderly. Underlying factors appear to be increasing insulin resistance with weight gain, obesity, and aging; decreasing pancreatic ß-cell function with aging; and increased body fat proportion with loss of muscle tissue. Elders are also more sedentary (with decreased calorie expenditure), but often maintain their high caloric intake (see Table 2). Even before diabetes becomes established, the ß-cell produces increasing amounts of insulin (hyperinsulinemia) to attempt to achieve glucose homeostasis. As insulin resistance increases, hyperglycemia eventually develops. Even though there are high

Table 2. Reasons for increased prevalence of diabetes in the elderly.

Maintenance of usual caloric intake, in spite of decreased caloric expenditure
Decreased physical fitness
Decreased physical activity (greater tendency to be sedentary)
Increased body fat (including intra-abdominal fat)
Decreased muscle mass
Weight gain (obesity as a trigger factor)
Increased insulin resistance
Decreased pancreatic ß-cell function
Delayed expression of a genetic predisposition*
* *Many have claimed that this is the primary defect in type 2 diabetes*

levels of circulating insulin, there is an insulin deficiency relative to what is needed to maintain normoglycemia. Multiple factors such as exercise, fitness level, diet, and medications influence insulin resistance and other metabolic factors. In utilizing oral medications to control diabetes, either insulin secretion is further stimulated (sulfonylureas), or glucose metabolism is altered (biguanides, α-glucosidase inhibitors). An interesting new class of oral agents works specifically on reducing insulin resistance (thiazolidinediones), and may help prolong the time before insulin is needed for effective glycemic control. In later phases, often in the elderly, the pancreatic ß-cell may become exhausted and an absolute insulin deficiency state will then exist, requiring insulin injections.

As in the general population, elders who are prime candidates for development of diabetes are individuals with a family history (one or more first degree relatives with type 2 diabetes), women who have had gestational diabetes (and/or macrosomic infants), and obese individuals who may have already demonstrated insulin resistance (see Table 3). Another factor may be delayed expression of a genetic predisposition.

Table 3. High risk conditions for type 2 diabetes.[1]

Positive family history of type 2 diabetes (first degree relative)
Impaired fasting glucose (IFG)
Impaired glucose tolerance (IGT)
History of gestational diabetes mellitus (GDM)
History of delivery of a macrosomic infant (over 9#)
Membership in an ethnic group with high diabetes prevalence (including AI/AN, Hispanics, African-American, Asians)
Obesity (in excess of 125% of IBW, or BMI over 27 kg/m^2)
Hypertension
Not being breast fed in infancy
History of renal disease in parents
Extremely high, or extremely low birth weight
BMI: body mass index
IBW: ideal body weight

Screening in the Elderly

The prevalence of diabetes in American Indians and Alaska Natives is 3 to 5 times that of the general population. Screening for diabetes in elders should occur at least every three years, and annually in those individuals at higher risk (see Table 3). Among American Indians and Alaska Natives age 65 and older with diabetes, 37% are male and 63% are female. The reason for this female preponderance is unknown, although this may be at least partially attributable to the facts that there are more females in this age group, and women are seen more often than men for health care concerns.

Special Considerations in the Elderly

The prevention of complications is a major element in improving the quality of life for elders with diabetes. Always remember that diabetes is a *chronic* disease with major, important *behavioral* components. Published studies show a significant delay in the onset and severity of complications of diabetes as glycemic control improves, both in type 1 and type 2 diabetes.[17] Diabetes need *not* be the cause of death or disability for the individual with this condition. *The patient is the primary control agent and is the one who actually controls and manages this disease*. Therefore, the provider's responsibility is to give the patient the knowledge, boundaries, motivation, and tools for effective disease management. If this knowledge transfer has not occurred *and has not been assimilated into the patient's practice habits*, the provider will likely only observe and document the patient's suffering of the ravages of the disease, and will be periodically called upon to provide emergency, tertiary, or end-stage interventions. When diabetes occurs in the elderly, there may be less provider incentive to monitor and tightly control hyperglycemic levels because of the shorter projected lifespan, which would mean fewer years of exposure to hyperglycemia. However, hyperglycemia in and of itself may cause distressing symptoms (nocturia, fatigue, etc.), and we know that diabetes complications can definitely be avoided or postponed with better glycemic control.[4]

Elders are often on many medications. The clinician should be aware of the potential disadvantages of certain drugs when prescribing for the elderly diabetic. The use of niacin for its lipid lowering effects and the use of thiazides for blood pressure and/or fluid management may contribute to the lack of adequate control of blood sugar. Beta blockers may also mask hypoglycemic warning symptoms, as well as the normal, intrinsic protective adrenergic response to hypoglycemia. There have also been reports of prolonged hypoglycemia in elders who are using sulfonylureas, both first and second generation.[5] As persons age, there is all the more possibility of drug/drug interactions, probable because elders are more likely to have comorbid conditions requiring other medications. Ideally, the number of medications should be kept at a minimum to avoid confusion and medically induced

"non-compliance," as well as to avoid competing actions or interactions. The provider should also always be aware that the patient may be taking medications or herbal preparations other than those prescribed by the medical system. Elders are more likely to have decreased kidney and liver function; this may affect certain medications (hypoglycemics and others), and drug dosages may need to be reduced.

Monitoring and Glycemic Control

Home blood glucose monitoring is a tool to give patients the knowledge necessary for control of their disease. Medicare will now pay for home blood glucose monitors for all patients with diabetes who are on medication.[4,10,13] Until recently, this was true only for those taking insulin. Computer analysis and graphic display of the memory from home blood glucose meters is available and can serve as a worthwhile guide in facilitating the monitoring of diabetes care and control.

What practical goals for blood glucose levels should be set for elders? Should management be "intensive," which carries the risk of hypoglycemic episodes? Glycosylated hemoglobin (HbA_1c) levels should be drawn at least twice yearly to determine the average glycemia level in the elder. While there are no "official" standards, guidelines have been proposed.[2] Especially in the frail elderly and elders who live alone, the degree of "tightness" of glycemic control must often be loosened. *Practical* blood sugar goals for the robust elderly, as well as the frail elderly,[2] are listed in Table 4. These values depart somewhat from the usual target levels used in intensive diabetes management, or euglycemic values, and are admittedly a compromise for safety in the geriatric patient.

Consider Comorbidity

Comorbidity should be considered in diabetes care and monitoring. Elders are more likely to have coexisting disease, such as cardiovascular or renal disease. After years of exposure to diabetes and hyperglycemia, and with the lipid abnormalities that result from or are compounded by diabetes, elders are more likely to have new onset cardiovascular disease, particularly hypertension, ischemic heart disease, and stroke. The preliminary results of the Strong Heart Study show high rates of coexistent cardiovascular disease in American Indians and Alaska Natives, with its associated morbidity and mortality.[6,7,8] Elevated lipids should be treated in hopes of preventing or minimizing ischemic coronary artery disease and stroke. Since diabetes is known to decrease immunocompetence, elders with diabetes should have routine immunizations against influenza and pneumococcus. Comorbidity increases the medical complexity and per patient cost of caring for diabetes in the elder.

American Indian and Alaska Native elders are less likely than the younger generation to be smokers (13% vs. 24%), and are more likely to have fair to good glucose control (75% vs. 63%). They tend to have a lower incidence of obesity (54% vs. 65%) than the younger person with diabetes (data from IHS Diabetes Program chart audits). However, elders have more uncontrolled and severe hypertension (44% vs. 28%), and more proteinuria (27% vs. 22%).

Table 4. Suggested targets for diabetes control.[2]

Younger individual	
FBS	70-120 mg/dl
Post meal	≤140 mg/dl
HbA_1c	within 1% of lab normal (<7.5%)
Healthy or robust elder	
FBS	100-140 mg/dl
Post meal	≤160-200 mg/d
HbA_1c	within 120% of upper lab normal (≃8%)
Frail elder	
FBS	120-140 mg/dl
Post meal	≤160-250 mg/dl
HbA_1c	within 150% of upper lab normal (≃9.5%)

Adapted. Note that the degree of control is loosened greatly in elders, especially in the frail elderly. Post meal refers to values 2 hours post meal.

Management of Diabetes in the Elderly

Diet instruction needs to be ongoing, and should take into consideration the individual's usual diet, as well as personal goals in management of disease. Non-routine snacks should be a displacement from a meal, *not* an addition to regular intake. High fiber diets may be useful in blunting blood glucose peaks, and also assist in control of bowel habit problems, such as constipation. Recognize the individual's personal reaction to having diabetes, as well as potential memory problems, and the challenges of complex routines or high technology. Always remember that he/she is an *individual* with diabetes, not a diabetic (they are a person, not *a disease* or *a case*). Exercise provides an alternate path for glucose metabolism, and studies in the elderly indicate that fitness activities benefit diabetes control. Maintaining activity appears to give a better outlook on life for the elderly individual. While control of hyperglycemia is important, *avoidance of hypoglycemia is crucial*, especially in the elder who lives alone. Life expectancy and quality of life are partially a function of the "tightness" of diabetes control, recognizing that blindness, end-stage renal disease, and lower extremity amputations are a much more frequent occurrence in the elderly.[17] Data show that of the total remaining life expectancy in the elderly, approximately one-fourth to one-half of that time may be spent at least partially disabled.[13] One of the principal responsibilities of the provider is to

prevent disability, so as to maintain a better quality of life. Disabling or debilitating disease in the elderly, especially progressive disease, is often the cause of depression and poses a risk for suicide.

Weight loss goals should be simple and achievable, even if modest. There is no quick fix. The goals must be those of the person with diabetes, and not the provider. Other goals may be as simple as maintaining enough eyesight to be able to read; keeping their feet and legs to be able to ambulate and take walks with their children and grandchildren; or not having to use a kidney dialysis machine.

Exercise is one of the three essential components of diabetes management (diet, exercise, and hypoglycemic agents). Studies of fitness training for elders and of elder athletes have shown that euglycemia is easier to maintain in the person who is physically fit. Muscle burns glucose more efficiently than fat. Physical activity in the person with diabetes promotes normoglycemia by reducing insulin resistance as well as providing an alternate pathway for glucose metabolism. Any reduction of hyperglycemia is always beneficial, and, when it is accomplished without medication, it is especially desirable. Improved fitness also reduces cardiovascular risk. The tendency for the elder to become sedentary is a major challenge in diabetic management. Exercise can be as simple as regular walking, housework, or gardening. Decreased stamina, however, may be a limiting factor.

Hypoglycemic agents must be carefully managed in the elderly. Elders sometimes eat erratically, both in terms of quantity and quality. This inconsistency may be exaggerated by poverty, and the elder may be reluctant to admit dire financial circumstances. The risks of hypoglycemia from glyburide and other sulfonylureas have already been noted. The use of insulin, in a person who is not eating properly or in sufficient quantity, may also induce a profound and sometimes delayed hypoglycemia, occasionally seen with intensive management using regular insulin. One approach to this problem is the use of LisPro insulin (a rapidly acting insulin analog), taken at the time of a meal. LisPro acts within 15 minutes, whereas regular insulin acts in anywhere from 30-180 minutes and may last for up to 5-6 hours. If the patient's eating habits are erratic, LisPro may be given post-meal, with the dosage adjusted according to the amount of food actually consumed. There are some advocates of using an extra long acting insulin (ultralente) for baseline effect, and then utilizing LisPro for coverage at each meal. Another oral hypoglycemic agent, the α-glucosidase inhibitors, may prove useful in elders due to their low incidence of side effects. The diarrhea sometimes noted as a side effect in younger persons may be advantageous for the elder patient for whom constipation is a problem. In elderly persons managed with combination therapy that includes acarbose (an α-glucosidase inhibitor that retards sugar absorption in the intestine), something other than ordinary table sugar (sucrose) must be used for treatment of hypoglycemia, since sucrose absorption will be blocked by the acarbose, which inhibits sucrase.

The newer oral hypoglycemic drugs may have a distinct synergism when used in combination (e.g., metformin with troglitozone, metformin with acarbose, or troglitozone with glyburide). Not only may this permit lower dosages of each, but there may be improved glycemic control. Although at initial glance this may appear more costly, better control may mean increased longevity or quality of life to the person with diabetes.[9,10,13]

Use of alcohol, especially binge drinking, complicates effective diabetes care. Alcohol is metabolized preferentially and rapidly by the liver in contrast to complex carbohydrates. With awareness of hypoglycemia dulled, hypoglycemic reactions may be more prolonged and potentially more severe under the influence of alcohol.

Attempts to achieve smoking cessation are well worth the years of quality life achieved, especially if there is lung disease already. Smoking increases arterial intimal damage and accelerates ischemic vascular damage, a major complication of diabetes. Even late in life, with only a relatively small increase in *quantity* of life, *quality* of life can still be improved by smoking cessation. Encouragement and referral to smoking cessation programs will work in the elderly.

Prevention of Complications

Aspirin should be considered for elders with diabetes with additional risk factors (known large vessel disease, family history of coronary artery disease, cigarette smoking, hypertension, obesity, albuminuria, or lipid disorder) as a pharmacologic means of preventing acute myocardial infarction and thrombotic stroke. The generally recommended dosage for cardiovascular prophylaxis is 65-80 mg (one baby aspirin tablet) daily, or 325 mg (an adult aspirin tablet) every other day. Contraindications such as gastrointestinal disease must be considered before prescribing aspirin.

It is often assumed that elders with diabetes need only be concerned about proliferative diabetic retinopathy. In reality, they are at risk for the same eye problems seen in elders without diabetes. Senile and/or diabetic cataracts, glaucoma, refractive changes due to changing glycemic levels in the aqueous and vitreous humors of the eye (due to poor or changing control of diabetes), as well as potential ocular muscle paresis are all reasons why the elder with diabetes should be seen regularly by an ophthalmologist and have a fundus exam annually. Maintenance of sight is an important way of maintaining independence and high quality of life in the elder. The Diabetes Control and Complications Trial (DCCT) has shown that maintaining levels of glycemia close to normal can delay the onset and/or progression of diabetic eye complications. None of the ocular changes that can occur due to diabetes are inevitable. In particular, retinal laser therapy can preserve sight in proliferative retinopathy, if it is

started soon enough, and if proper glycemic control is attained and maintained.

Proper evaluation of and preventive care for the feet can minimize the threat of lower limb amputation. Amputations are closely correlated with the presence of diabetic neuropathy. Both duration and severity of hyperglycemia correlate with the cumulative prevalence of diabetic neuropathy.[11] Older age, male gender, and alcohol use also contribute. The sensory deficit is typically distal rather than proximal, and is commonly referred to as "stocking-glove" in distribution. There may also be dysesthesia, paresthesia, spontaneous pain, and/or sensory loss. Motor symptoms may consist of distal weakness and atrophy. All of these are preliminary to the unrecognized or recognized trauma, which combined with the altered blood flow (micro- and macrovascular disease) leads to diabetic ulcer, diabetic infection, diabetic gangrene, and lower extremity amputation. Diabetes is the leading cause of non-traumatic lower extremity amputation in the United States today, much of which can be prevented, especially by good footwear and early intervention and care. It is not unusual for a patient presenting with symptoms of one neuropathy to have another neuropathy, which may be entirely asymptomatic and possibly unrecognized (see Table 5).

Table 5. Classification of diabetic polyneuropathies.[11]

Generalized polyneuropathy
Distal symmetric polyneuropathy
Acute painful diabetic neuropathy
Autonomic polyneuropathy
Subclinical polyneuropathy
Multiple mononeuropathies
Proximal lower extremity motor neuropathy
Truncal neuropathy
Mononeuropathy
Cranial mononeuropathy
Compression mononeuropathy

Neuropathies should be evaluated, and individualized and specific cautions should be prescribed for the elder regarding protection of the feet from trauma. The feet should be inspected regularly by the elder and the health care providers for signs of unrecognized trauma, especially in those elders with sensory neuropathy. Monofilament testing will educate the patient and assess pain sensation. Vibratory sensation, balance, and position sense should be tested with tuning fork, clinical examination, and/or electrodiagnostic studies, if indicated. Neuropathy should then be delineated into large fiber, small fiber, autonomic, and/or mixed varieties. The patient can then be given some prognostic information regarding potential course of the neuropathy, and the degree of additional protection necessary to preserve the feet can be predicted.

Elders need to be trained in routine, periodic, ritualized, and thorough foot inspection. While seemingly simple, inspecting the bottom of the foot may be difficult or impossible for the individual who has limited joint mobility or poor vision. A mirror can be used (even placed on the floor) to facilitate foot inspection, and family members can be trained to assist with this important task. Minor, and even major foot trauma or infection may be completely asymptomatic and go unrecognized in the foot with neuropathy until too late. Patients with sensory neuropathies, when combined with foot deformities (hammer toes, bunions, pressure points), are at the highest risk for diabetic foot ulceration, infection, and amputation.[16]

Recommendations for the Provider

- Use the IHS Diabetes Program's Standards of Care as a guide.
- Whenever possible, attempt preventive, anticipatory care first.
- Make sure that the elder has ongoing contact with a diabetes educator and access to current information about the disease. Make every elder an educated, motivated, and sophisticated consumer.
- Consider making a contract with the elder regarding management goals, and give encouragement/congratulations when goals are achieved.
- Obtain glycosylated hemoglobin levels (HbA_1c) at least semi-annually or quarterly so that the degree of control attained and risk of complications can be predicted or anticipated. Give the person feedback (and positive encouragement if applicable) on these as well as other results.
- Recognize quality of life goals for the individual. Treatment measures should be proven and simple in nature, not complex, and should fit with the individual's own goals.
- Use a minimum number of medications; use complex medical routines only if necessary. Remember that prescribing for elders is as complicated as prescribing in pediatrics. Dosage schedules and amounts may be different, especially with comorbid diseases/conditions.
- Recognize the inherent wisdom and durability for the individual to have reached that age. Always remember that he or she is a person or a patient with diabetes, not just "a diabetic" or "a case."
- A record should be maintained of the teaching done for the elder, and some effort made to periodically update the education given to keep it current with up-to-date developments on the topic of diabetes management and control. Remember that the elder is the actual control agent.
- Elders serve as role models in their communities. Many want to pass on their good experiences and knowledge to their friends and progeny, and this should be facilitated, as a quality of life issue.

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Authors' note

Much of this article was derived from notes taken at the 1998 NIDDK/ADA Conference, "Diabetes in the Elderly," held March 27-29 in Tempe, Arizona, sponsored by the IHS Clinical Support Center. This article is dedicated to the memory of a very vocal and enthusiastic advocate for Native American elders, Dr. Pat Stenger, a geriatrician who was our colleague and associate in the Office of Health Programs, Phoenix Area Indian Health Service. We also wish to thank colleagues in the Office of Health Programs, and at the Phoenix Indian Medical Center for review and critique of, suggestions about, and contributions to this manuscript.

Editor's note

While this article provides a broad survey of the topic of diabetes in the elderly, we would invite our readers to submit follow-up articles that explore each of the issues raised in more depth. □

A 1999 Elders Calendar

In December 1997, the Phoenix Area Indian Health Service (PAIHS) Elders Committee published their *1998 Elders Calendar*. Dedicated to the memory or Dr. Pat Stenger (the former coordinator of the IHS Elder Health Care Initiative), the calendar is directed towards elders themselves. Each monthly narrative is a bullet-style listing of helpful suggestions for elders. For example, in July there are suggestions about maintaining good foot hygiene and health; October provides information about proper oral hygiene. Each narrative is intended to be useful to the viewer. The monthly pictures were drawn by Anthony Honanhie, a member of the Hopi tribe and a well known artist of the southwest.

Funding for the calendar was provided by the Elder Health Care Initiative and the Phoenix Area Substance Abuse Program. A total of 1,850 calendars were printed and distributed throughout the Phoenix Area.

The Phoenix Area Elders Committee is considering producing a 1999 calendar even though funds may not be available again from the EHCI. Other considerations are to charge a small amount for the calendar to offset printing costs and to make the calendar available on a nationwide basis.

The Phoenix Area Elders Committee would enjoy hearing your thoughts on this matter. Please contact them by writing to:

Elders Committee
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Phoenix, Arizona 85004

or call (602) 364-5176.

Injury Mortality and Prevention Strategies for Elderly American Indians in the Phoenix Area Indian Health Service

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Introduction

Elder health and injury prevention are major initiatives of the Indian Health Service (IHS). Given the greater absolute number of injuries in younger age groups, there has been less emphasis on injury prevention in the older population. However, injuries are a significant cause of death among elderly American Indians and Alaska Natives — the fourth leading cause of death for persons 55-64 years old, and the seventh leading cause for those ages 65 and older.[1]

Injuries among elderly American Indians pose unique patient management and prevention challenges. Severe injury is often the first step in the decline and deterioration of health in many elders. A severe injury may also limit the mobility, freedom, and autonomy of elders and begin their dependence upon others for their care. This article examines the causes of American Indian elder deaths over a 15 year period in the Phoenix Area of the IHS, and offers guidance for elder American Indian injury prevention.

Methods

Mortality data were obtained from IHS mortality tapes. Each year, the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS) provides IHS with a mortality tape based on death certificate data for all U.S. decedents. IHS then categorizes these data by IHS Area. The data set for this study includes all deaths of American Indians residing in the service area of the Phoenix Area IHS during 1979-1993. Phoenix Area IHS is comprised of a geographical area that includes Nevada, Utah, and portions of Arizona and California. Service population figures for Phoenix Area IHS were obtained from 1980 and 1990 revised census data. In this study, elders were defined as persons age 55 years and older. The U.S. All Races crude mortality rates for 1979-1993 for the grouped ages 55 and over were calculated from statistics obtained from CDC's National Center for Injury Prevention and Control.

International Classification of Diseases, 9th Revision (ICD9) external cause of injury (E-codes) in the data set were used to identify causes of injury-related death (E800-999). Average annual injury-related mortality rates are expressed as the number of deaths per 100,000. Data were analyzed using Epi Info, Version 6.02 statistical software.

Results

There were 282 elder deaths due to injury during the 15-year time interval. The leading causes of injury death for Phoenix Area elders are shown in Table 1 and Figure 1. Motor vehicles accounted for more than one-third (36.8 percent) of all deaths. Phoenix Area elder injury mortality rates exceeded the U.S. All Races rates for every cause except self-inflicted. The total injury mortality rate for Phoenix Area elders was more than double the U.S. All Races elderly rate. Motor vehicle pedestrian and environmental factors mortality rates were exceedingly high for Phoenix Area elders, exceeding the U.S. All Races elder rates by 7.8 and 12.3 times, respectively. The all-injury mortality rate for Phoenix Area male elders was more than 3.5 times higher than that for females. Motor vehicle-related deaths in Phoenix Area elders exceeded the U.S. All Races elder rate by almost four times. Males had a motor vehicle mortality rate that was five times higher than that for females. Motor vehicle-related pedestrian deaths were exceedingly high for Phoenix Area elders, especially males. In contrast to the U.S. All Races rates in which 23.1% of motor vehicle-related deaths were pedestrian, almost half (49.5 percent) of all Phoenix Area elders killed in motor vehicle crashes were pedestrians. In male elders, motor vehicle pedestrian fatalities accounted for an astonishing 59.5% of all motor vehicle-related deaths. In contrast, 15.7% of female motor vehicle-related deaths were pedestrian in nature.

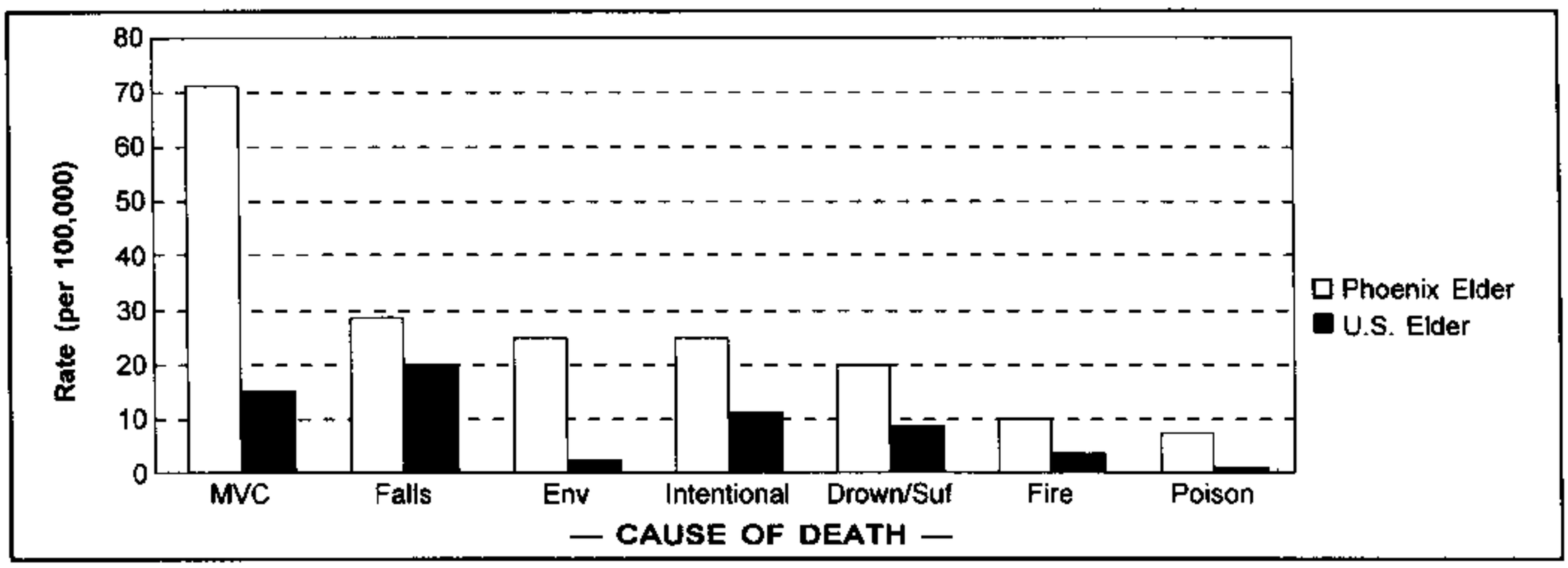
The rate of deaths by fall for Phoenix Area elders was slightly higher than the U.S. All Races Rate (ratio: 1.4:1). Elderly Phoenix Area males had more than twice (2.4 times) the rate of fall-related death as elderly females. In contrast, the U.S. All Races male rate is only 1.1 times higher than the female rate. It was not possible to determine leading causes of falls because most (60 percent)

Table 1. Numbers and crude rates (per 100,000 population) of injury-related death for elder* American Indians by gender in the Phoenix Area IHS, 1979-1993; and Phoenix Area to U.S. All Races crude rate ratios.

	Male		Female		Total		U.S. All Races	
Cause of Injury	No.	Rate	No.	Rate	No.	Rate	Elder Rate	Ratio
Motor Vehicle	82	124.6	19	24.9	101	71.1	19.5	3.6
MV Pedestrian	47	74.1	3	3.9	50	35.2	4.5	7.8
Falls	27	41.0	13	17.1	40	28.2	20.0	1.4
Environmental	32	48.6	3	3.9	35	24.6	2.0	12.3
Intentional	25	38.0	10	13.1	35	24.6	23.2	1.1
Assault	16	24.3	8	10.5	24	16.9	4.9	3.4
Self-Inflicted	9	13.7	2	2.6	11	7.7	18.1	0.4
Drown/Suff.	24	36.5	3	3.9	27	19.0	6.5	2.9
Fire	6	9.1	6	7.9	12	8.5	3.8	2.2
Poisoning	5	7.6	3	3.9	8	5.6	1.4	4.0
All Injuries[1]	**216**	**328.2**	**66**	**88.6**	**282**	**198.6**	**90.1**	**2.2**

* Elder: persons age 55 years and older
Phoenix Area Rate ÷ U.S. All Races Elder Rate
[1] Includes listed injury causes as well as other minor injury categories

Figure 1. Causes of injury-related death, Phoenix Area IHS and U.S. All Races elders, 1979-1993.



were coded as E887 "fracture, unspecified cause" and E888 "other and unspecified fall." In order to ascertain this information, improved documentation is needed on vital statistics documents (e.g., death certificates and death registers).

Incredibly, the mortality rate from environmental factors was 12.3 times greater for Phoenix Area elders than U.S. All Races. The majority (91.4 percent) of these deaths were in males. Heat-related deaths occurred in Phoenix, Sacaton, Fort Yuma, and Colorado River Indian Tribes (CRIT) Service Units, which typically have very high summer temperatures. The majority (42.9 percent) of hypothermia deaths occurred in the Whiteriver Service Unit, which typically has cold winters. The remainder occurred in Uintah-Ouray, Schurz, San Carlos, Owyhee, Keams Canyon, and CRIT Service Units, most of which also have cold winters.

The drowning/suffocation rate was almost three times higher for Phoenix Area elders than the U.S. All Races elder rate. Six of the thirteen elder drowning deaths were attributed to swimming pools/quenching tanks; these victims were all males who were residents of the Colorado River, Phoenix, and Sacaton Service Units. The majority (92.9 percent) of suffocations were caused by aspiration of food or other objects; almost three-fourths (72.7 percent) were males.

The poisoning rate for Phoenix Area elders was four times higher than the U.S. All Races Rate. Twice as many males died from poisoning as females. Half of the deaths were attributed to drugs and medicinals, half to other solids and liquids, and one death was due to denatured ethanol.

The primary cause of fire-related death was from residential house fires (83.3 percent). Two deaths (16.7 percent) were attributed to clothing ignition. The Phoenix Area elder fire death rate was more than twice the U.S. All Races elder rate. Male and female elders had similar rates of fire-related death.

Phoenix Area elders had an assault rate that was over

three times higher than the U.S. All Races Rate. However, the mortality rate due to self-inflicted injury was less than half the U.S. All Races Rate. Males had higher rates of both self-inflicted and assault-related death.

Discussion

Mortality rates of Phoenix Area elders exceeded the U.S. All Races Rates in all classes of unintentional injuries. The following discussion highlights successful injury prevention strategies and those that show promise of preventing injuries in the elderly. Emphasis is placed on the injuries for which Phoenix Area elderly are at most risk: motor vehicle-related injuries, falls, and exposure.

Motor Vehicle Occupants. Elderly persons are at greater risk of motor vehicle-related death because of the physiology of aging (e.g., impaired vision, hearing, and mobility to respond to emergent situations) and their poorer survivability following a crash.[2,3,4] Nationally, elders are least likely to drink and drive, more likely to wear seat belts, and drive fewer miles than younger age groups.[2] However, American Indian elders may be at higher risk of motor vehicle occupant death because of low seat belt use, community conditions such as poor roads, inadequate or nonexistent street lighting, and lacking or distant emergency medical services.[5]

Working in partnership with such agencies as the IHS, the National Highway Traffic Safety Administration (NHTSA), and the Bureau of Indian Affairs (BIA), many tribes have implemented successful and promising strategies for reducing motor vehicle-related occupant injuries. Seat belts are a proven strategy estimated to reduce motor vehicle fatalities by 45%-60%.[6] Restraint use is increased by mandated usage coupled with strict enforcement. One example of a successful occupant protection effort is the Navajo Nation, which passed a primary enforcement law in 1988.[7] Within two years, motor vehicle-related hospitalizations declined 28.5%, and within three years, seat belt use rates increased from 14% to 60%.

Motor Vehicle Pedestrians. Elderly persons, especially those over 70 years old, have the highest pedestrian death rates of any age group.[8] Elderly American Indians may be at higher risk of pedestrian death because their communities typically have more rural roads and may lack adequate sidewalks, street lighting, and public transportation. Elders may be more prone to walk because they cannot afford a vehicle, or may have an older or poorly maintained vehicle.

A variety of environmental modifications have proven effective in reducing pedestrian injuries and deaths. For example, in response to a cluster of nighttime pedestrian fatalities on the Fort Apache Indian Reservation in Arizona, the Whiteriver Service Unit implemented a highway lighting project.[9] Although an evaluation of this project is currently in progress, a dramatic decrease in pedestrian injuries has been observed in the project area.[10] Other roadway lighting projects in American Indian communities include those on the Blackfeet Reservation in Montana, the Eastern Band of Cherokee Indians in North Carolina, and the Jicarilla Apache Reservation in Gallup, New Mexico.

Through state highway construction projects, IHS, and/or tribal funding, pedestrian walkways/bike paths have been completed in Sells, Arizona; Fort Belknap, Montana; Fort Totten, North Dakota; and other locations. These improvements provide an alternate to walking on the roadway for pedestrians to travel between housing areas and schools, stores, offices, etc. Other approaches to preventing pedestrian injuries include painting edge lines on roads, and construction of barriers and walkways to provide physical separation of pedestrians from vehicles.[5]

Falls. Phoenix Area elders, especially males, are at high risk for fall-related death. Most falls are due to a combination of physiological and environmental factors.[11] Gait and balance disorders, visual and cognitive impairment, osteoporosis, use of sedatives and hypnotics, and use of multiple medications increase the risk of falls.[12,13] Environmental factors such as dangerous stairs, clutter, loose rugs, slippery floors, and poor lighting are implicated in 18-50 percent of elderly falls in the home.[5,12]

There are many examples of tribal, IHS, and Housing and Urban Development (HUD) initiatives to improve the indoor home environment. These projects typically include installation of grab bars in bathrooms, handrails on steps, use of non-skid mats and rugs, and improvement in room and hall lighting. The majority of these interventions have not been formally evaluated or published.

The IHS Whiteriver Service Unit conducted a case-controlled study of physiological and environmental factors associated with porch step falls on the Fort Apache Reservation in Arizona.[13] Environmental hazards that were associated with falls included steps with shorter tread and width, absence of hand rails, and absence of outdoor lighting and indoor plumbing. Physiological factors were not associated with these falls. Most victims of falls lived in Housing Improvement Program (HIP) or private homes which were not subject to uniform porch step construction. This Service Unit is currently pursuing porch step improvement as an intervention strategy.

Fatalities and complications from injury increase in persons rescued more than one hour after being injured.[15] Elderly people who fall often have difficulty getting up and getting help.[5] Floor-level emergency alarms or personal emergency "beepers" provided to high-risk elderly people allow them to call for help. A high fall death rate on the Cherokee Reservation in North Carolina resulted in distribution of personal emergency notification "beepers" to high-risk elderly.[14] When "beepers" are activated, the local IHS hospital is notified. However, consideration should be given to the cost of starting such a system, monthly fees, and whether local service is readily available.

A comprehensive fall intervention strategy would combine primary prevention, clinical assessment to identify high-risk individuals, and targeting of appropriate physiological and environmental interventions. This approach requires

collaboration and case referral between primary care providers and environmental health professionals, community health representatives, and health educators for home visits. This strategy was used in a non-reservation community to target interventions appropriate to elderly with given risk factors.[15] Interventions included medication adjustment, behavioral (health) education, and exercise programs. In homes, safety equipment was installed and environmental hazards were removed. Within one year, the case group fall rate had decreased significantly ($p < .04$).

Environmental Factors. Surprisingly, the third leading cause of injury death in Phoenix Area elders was exposure. The typical victim was a male who died of hypothermia. Elderly are more susceptible to cold because of impaired thermoregulation.[16] The association of alcohol consumption with hypothermia was not available in the database. However, one study observed that American Indians living in New Mexico had a hypothermia rate 30 times greater than non-Indian residents.[17] Of these deaths, most (86 percent) were male, most of those tested for blood alcohol levels (BACs) were intoxicated (BAC > 0.10 mg/dL), and the highest death rates were in persons 55-64 years old. The authors concluded that victims had died while traveling off of dry reservations to obtain alcohol. In response to a large numbers of pedestrians killed, and persons dying from hypothermia in McKinley County, New Mexico, intoxicated pedestrians are picked up and taken to an alcohol detoxification center in Gallup for 48 hours.[18] This reduces the risk of pedestrian as well as hypothermia death.

The elderly may live in homes that are too cold or too hot because they cannot afford to pay utility bills for heating or cooling.[16,19] General guidelines for preventing elderly hypothermia include improving room heating, increasing clothing worn during the day and at night (e.g., hat, long underwear, and mittens), and using additional dry, warm blankets at night.[16,19]

Fire and Flame. Efforts in preventing elder fire/flame-related deaths should focus on the home environment. Smoke detectors are "potentially the most cost-effective tool we have for reducing deaths from fires."[20] A smoke detector can reduce the risk of residential fire death by 40% or more.[21] However, a majority of homes on the Spirit Lake Sioux Reservation in North Dakota (formerly Devils Lake Sioux) lacked adequate numbers of smoke detectors to meet minimum National Fire Protection Association (NFPA) standards.[22] On that reservation, as well the Fort McDowell Reservation in Arizona, in those homes that had smoke detectors, a majority (primarily ionization-type) were disconnected due to nuisance alarms, usually from cooking and bathroom steam.[22,23] To overcome the nuisance alarm problem, ionization detectors should be installed at least 20 feet from the stove and 10 feet from the bathroom door.[22] If this separation is not possible, photoelectric alarms, which are less sensitive to cooking vapors, are recommended.

A coalition on the Cherokee Indian Reservation in North Carolina used a combination of environmental modifications to address home fire-related injuries.[24] Smoke detectors were installed, rapid-burning stair paneling was replaced with sheet rock, and fire extinguishers were provided. Because homes were typically two-story with only one exit door, temporary fire escape ladders were provided until permanent secondary fire exits could be constructed. Within five years, fire-related injuries had decreased by 26%.

Study Limitations

The IHS mortality tapes provide only general information about injury events, and, for injuries such as falls and environment-related, lack detail needed for developing specific local interventions. Underestimation of census figures, by as much as 12.5%,[25] might increase the magnitude of injury rates calculated. However, the rates presented in this article are probably underestimated because of 1) miscoding of American Indians as other races, which in the Phoenix Area is estimated at 4.4 percent[26] (in some Areas, miscoding is as high as 30 percent), and 2) failure to code a large percentage of injuries as the cause of death in elderly persons.[27] For example, elderly deaths actually due to injury may be coded in vital statistics as deaths from pneumonia or heart failure.

Recommendations

Phoenix Area elderly suffer high rates of injury death. Given limited resources, effort should be concentrated on those causes of injury for which elders are at the highest risk of death. In the Phoenix Area, these are motor vehicle-related, falls, and environmental factors. Because elderly injuries have an important physiological as well as environmental component, successful prevention requires the collaboration of environmental health professionals as well as primary care providers, social services, health educators, and other community health professionals.

This study emphasizes the need for:

- Improvement of provider coding of causative information related to injuries, especially falls;
- Local severe injury surveillance, which is routinely completed by environmental health staff at some service units. Local data collection reveals details about the nature of injury that are lacking in vital statistics data;
- Further study to determine whether exposure deaths are due to lack of transportation or lack of adequate shelter (heating or cooling).

Conclusions

As public health officials, we have developed appropriate anticipatory guidelines for newborns, infants, teens, and young adults. Based upon sound epidemiological data, as well as proven intervention strategies, we can also produce guidance to assist our elders in living full and complete lives without premature death or disability due to a predictable and consequently preventable injury.

We know enough to act. Readers of this article should determine the best way to impart this information to your patients or clients. Table 2 identifies simple strategies to reduce this burden of trauma on our most senior citizens. Second, reach out beyond your patient or client to the community. Can your voice as a public health advocate assist a community coalition in ensuring that every elder's home is protected by a functioning smoke detector, for example?

Our elders have given a lot to us. This is a cause worth our investment in time and energy.

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Table 2. Simple strategies to reduce elderly injury deaths.

Motor vehicle
- Use of seat belts
- Safe pedestrian walkways and roadway lighting
- Protective custody/safe (sober) rides

Falls
- Home modifications for elders with reduced mobility
- Medication review and modification
- Exercise programs
- Hormone therapy to prevent osteoporosis

Environmental factors
- Home visitation in extreme temperature periods
- Community shelter and transportation service
- Adequate heating and cooling of homes

Fire
- Working smoke detector in home

Poisoning
- Medication review during clinical visits
- Prescription counseling with relatives
- Proper labeling of medications, use of original containers
- Removal and safe disposal of old medication

Assault
- Effective tracking and referral of victims and high-risk individuals
- Home visitation, 911 emergency service
- Community safe house

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A Voice for Indian Elders

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The interface between managed care policy and the Indian health care delivery system has enormous implications for how health care is funded and delivered in Indian communities. The National Indian Council on Aging is conducting a project to help Indian elders understand and influence managed care and health-related policy. The project, "A Voice for Minority Elderly in the Health Care Debate," is funded by the W. K. Kellogg Foundation. Participating organizations include the National Hispanic Council on Aging, the National Asian/Pacific Council on Aging, the National Caucus and Center on Black Aged, and the National Indian Council on Aging (NICOA).

The Indian component, "A Voice for Indian Elders," is managed by NICOA and guided by the project's American Indian Managed Care Steering Committee. Our mission is "to create a comprehensive process through which Indian healthcare consumers, Indian healthcare providers, and tribal leaders can collectively examine and address the managed care issues that affect them in ways which ensure that the beliefs, culture, spirituality, and traditions of Indian communities are reaffirmed and strengthened by the managed care systems that serve them."

By conducting forums with Indian elders, health care providers, and key national, state, tribal, and legislative leadership, the phases of the project seek grassroot input to 1) identify pertinent managed care and health-related issues affecting Indian elders, 2) solicit recommendations for how to target good health care for Indian elders, 3) identify viable solutions to health care issues and concerns, and 4) encourage and support collaborative solution-oriented activity which will enhance and improve health care for Indian elders.

First year activity began in New Mexico. In its second year, the project will develop an educational/training program on managed care, and help IHS sponsor a National Indian Health Board (NIHB) nine-state study of Medicaid managed care provisions that affect Indian health. In addition, the project will expand to encompass regional forums and a national forum to be conducted at NICOA's national conference on Indian aging scheduled for August 23-25, 1998 in Bismarck, North Dakota.

Coping with the complications and confusion of managed care policy is difficult at best, and major problems with nutrition, transportation, housing, education, employment, and health make improving the quality of Indian elders' health even more difficult. Yet, when New Mexico's Indian elders were invited to discuss their health-related concerns at a two-day forum held November 13-14, 1997, nearly three-hundred people — primarily Indian elders — participated. This overwhelming response indicates that Indian elders want to understand and play a significant role in the management of their health care.

The intent of managed care policy is to control costs while maintaining quality in the delivery of health care. However, historically, the Indian health care system has only been able to meet about 50% of the actual health care needs of Indian people, and reliance on third-party billing to make up some of the difference is growing. And as Medicaid dollars are block-granted to states, some state Medicaid programs create significant complications and barriers for reimbursement to Indian health care facilities who provide health care to Medicaid enrollees. Indian Health Service, Tribal, and Urban Program facilities (I/T/Us) now have to negotiate with states for badly needed Medicaid funding. Unfortunately, states may not consider themselves bound by the federal trust responsibility to provide health care for Indians, and I/T/Us must contract with HMOs if a state makes no provisions for direct reimbursement.

Adequate funding resources are necessary for health care delivery. However, when discussing health care issues, Indian elders focus on and express their most serious health care concerns about quality of care issues. While the Indian health care delivery system is generally their preferred system of choice, many elders say they worry about the quality of care they receive. Elders have expressed their concerns through many surveys in the past, yet they feel little is done to address those concerns. Elders say they prefer long-term relationships with qualified doctors, nurses, and staff who are committed to knowing their comprehensive health care needs and who address those needs with respect in culturally appropriate ways.

The health care concerns of Indian elders are well docu-

mented. Health care professionals who are committed to providing health care to Indian people are often painfully aware, too, of the concerns and issues elders raise. Even the most committed health care professionals find it difficult to provide quality health care when they are faced with inadequate funding and limited staff who are often insufficiently trained.

Indian elders say they need 1) a comprehensive health care delivery system that is culturally sensitive to their needs, 2) adequate funding resources to provide comprehensive health care services, including preventive health care, and 3) educational/training resources so elders (and their families) can understand and obtain the health care services they need.

Creating a comprehensive process to address these needs will undoubtedly be difficult. Our intent is not to place blame and criticism on the health care systems that serve Indian elders. Our intent is to acknowledge that the responsibility for creating positive support and change lies with each of us. As we listen to the voice of Indian elders it becomes apparent that elders do not want to simply complain about their concerns; the real message they want to convey is that they want to play a role in helping us create viable solutions to the health care issues and concerns of Indian people. □

CSC Receives Six Year Accreditation from ANCC

The IHS Clinical Support Center recently applied for reaccreditation of the nursing continuing education program by the American Nurses Credentialing Center's Center on Accreditation (ANCC). We are pleased to announce that the Commission on Accreditation granted the IHS Clinical Support Center accreditation for a full six years, through February 2004. Two ANCC nursing site surveyors reviewed continuing education files, examined CSC policies and procedures, made telephone calls to participants, and interviewed professional and support staff. The site visitors were highly complimentary of the CSC's multidisciplinary approach to continuing education and the cooperative team spirit.

No deficiencies or corrective actions were noted in the site review. However, there is an aspect of the design of educational activities that nurse CE planners need to consider. Each activity should have a purpose or goal clearly stated. This purpose or goal is a statement that describes how the activity will enrich the nurses' contribution to quality health care and his or her pursuit of professional career goals. Determination of the purpose/goals(s) does not prevent the use of a theme, but a purpose or goal needs to be identified.[1]

The objectives for the activity are then derived from the overall purpose or goal(s). The evaluation plan then requires a method to assess the:

1. Relationship of the objectives to the overall purpose/goal(s) of the activity.
2. Learner's achievement of each objective.
3. Expertise of each individual presenter.
4. Appropriateness of teaching strategies.
5. Appropriateness of the physical facilities.

The evaluation, if properly designed, can generate data that can be used to determine the effectiveness of the activity and provide support for any changes or improvements for future offerings. As always, our office is here to help you with your continuing education needs. Please feel free to call if you need assistance.

[1]American Nurses Credentialing Center. Manual for Accreditation as a Provider of Continuing Education in Nursing. 1996: pp 37, 40

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