The Pathways study logo is a symbol of the overall mission of Pathways among the culturally diverse tribes participating in the study. Each of the symbols and items composing the logo are sacred to the tribes. These are depicted in a manner to illustrate unity among the tribes and the universities to accomplish the mission of Pathways.

OPTIONAL: The logo incorporates four primary elements which are common to the cultures of almost all tribes: the cardinal number four, the circle, the arrows, and the concept of health or well-being. Four is a cardinal number for many Indian tribes and is often associated with objects or meanings that are sacred: the four directions, the four sacred mountains, and the four sacred colors of the tribe. The story of creation among many Indian tribes includes the evolution of people through four worlds. The logo, thus, has four sacred circular objects, and between these are four arrows pointing towards the four cardinal directions.

The importance of the circle to many Indians is depicted by the overall shape of the logo as well as by the shape of the four sacred symbols which are separated by arrows. The shape of many traditional Indian homes is round such as the Apache wickiup, the Navajo hogan, and the tipi of the Plains Indians. Religious ceremonies are performed in circular structures such as the hogan, tipi, and kiva. Traditional dances are performed in a circle. The motion of the sun, moon, and stars across the sky is circular. The life path of all creatures, including humans, is also circular.

The four arrows point outwardly in the four cardinal directions. The arrows also represent protection from the ever-present forces of evil that may come near the sacred objects. The arrows also stand for the maintenance of peace. The concept of health and well-being is embodied in each of the four items mainly in their use in religious ceremonies, which for most tribes, are conducted to restore or preserve well-being.
Slide #2

Pathways is an 8-year, 2-phase, school-based, obesity prevention study of American Indian schoolchildren. It began in Fall 1993 and will end in Spring/Summer 2001. Phase One was a planning and feasibility phase. Phase Two, in which we are now, is the implementation of a full-scale study.
Why is the study being conducted?

Earlier in this century, heart disease was rarely noted in American Indians, but in the last decade heart disease has become the leading cause of death in American Indians. The prevalence of diabetes has also increased and is also a leading cause of death. Several factors may be responsible for these increases including the increasing prevalence of obesity. There is evidence that the prevalence of obesity is high among American Indians in various geographic areas and that the obesity rates in American Indian children are higher than the respective rates for the general U.S. population. Obesity in childhood may impose a risk for obesity, heart disease, and other chronic diseases, such as diabetes, in adulthood.

The causes of obesity are complex and not clearly understood, but the fact remains that for an individual to add fat to the body requires taking in more energy (calories) than is expended. The increasing rate of obesity may be related to fairly recent changes in lifestyle among many American Indian populations, most of which developed obesity in less than a generation. As late as 1967 malnutrition was a serious health problem; however, in the late 1960's food assistance programs became available to reach malnourished people, and today a variety of Federal programs are available. At the same time, physical activity markedly decreased. So it can be speculated that the cause of obesity in American Indians is related to the relative abundance of calories and high-fat foods accompanied by rapid changes from an active to a sedentary lifestyle.

The diversity of the American Indian population provides challenges for effective health program planning. Many health professionals and researchers have advocated culturally sensitive and community-based approaches to heart disease and diabetes risk reduction education. Intervention studies are needed urgently in American Indian communities to develop and test effective programs to encourage increased physical activity and healthful eating habits. It is thought that prevention begins in childhood with the establishment of healthful lifestyle behaviors or habits that will be carried through a lifetime. Many health education programs have been successfully delivered through schools in collaboration with the families and community.
Slide #4

Pathways is being conducted in cooperation with seven Nations:

Ndee’ (White Mountain Apache Tribe), Arizona
Dee’ (San Carlos Apache Tribe), Arizona*
Akimel O’odham (Gila River Indian Community), Arizona
Tohono O’odham (Tohono O’odham Nation), Arizona
Dine (Navajo Nation), New Mexico, Arizona, Utah
Sicangu Lakota (Rosebud Sioux Tribe), South Dakota
Oglala Lakota (Oglala Sioux Tribe), South Dakota

OPTIONAL: *Dee (San Carlos Apache Tribe) is participating in Phase 2. All other tribes have continued participation from Phase One to Phase Two.
Slide #5

and five universities:

    Johns Hopkins University
    University of Arizona
    University of Minnesota
    University of New Mexico
    University of North Carolina

The study is sponsored by the National Heart, Lung, and Blood Institute of the National Institutes of Health in Bethesda, Maryland.
Slide #6

The study is, therefore, being conducted by multiple centers across the country. The University of North Carolina serves as a Coordinating Center to manage data and conduct statistical analyses. Each of the Nations and the four remaining universities, with which the Nations are affiliated, serve as Field Centers. Each Field Center is implementing the Pathways program, which is standardized across all sites; that is, all sites will be delivering the intervention and conducting the measurements in the same way.
Before implementation of the feasibility and full-scale phases of the study, the components of the project were approved by the communities. The approval processes varied from site to site but included tribal councils, as well as university and tribal review boards. Also, approvals were sought from local Bureau of Indian Affairs and Indian Health Service, and school boards. All schools or school boards were required to sign a Single Project Assurance which is another means to assure protection of human subjects, in this case the schoolchildren, from research risk, even though Pathways is a minimal or no-risk study. Children’s participation in the study is strictly voluntary and requires written permission (informed consent) by their parent or caretaker. Finally, periodically experts outside the study review the study progress and make recommendations to the study sponsor, the National Heart, Lung, and Blood Institute, on the conduct of the study.
Slide #8

What was the purpose of Pathways Phase One?

The primary goal of that three-year phase was to assess the feasibility of implementing a culturally appropriate, school-based program for promoting healthful eating and physical activity behaviors in children to reduce their subsequent risk for obesity.
How was the program developed?

In order to develop, implement, monitor, and evaluate a project that is appropriate for American Indian children at all sites, a program was developed that considered a number of factors, including:

- the uniqueness of the cultural values and beliefs among the respective Indian tribes,
- sensitivity to American Indian experiences with previous research efforts,
- hunger and malnutrition,
- availability of healthy food and opportunities to increase physical activity,
- privacy and confidentiality of individuals,
- respect for tribal-related information,
- existing programs, policies, and school mandates, and
- differences among schools, environment, and community structure among the Indian communities.
In addition, to develop an intervention program which is best suited for the people to whom it will be applied, their input in its development is essential. Each Pathways site has identified key tribal, community, and school individuals who advised the researchers on the conduct and content of the study. Also, each site has included among the research project staff American Indians from the participating communities. It has been essential that there be cultural representation on all committees and working groups within Pathways. One Pathways committee, now called the Seven Nations Committee, is composed exclusively of American Indians to discuss cultural issues relevant to measurement instruments and methods, as well as intervention strategies.

The first major effort of the study in Phase One was to conduct a needs assessment which involved individual and group interviews with children, parents, school staff, and other individuals who could potentially be involved in the program delivery. This information was used to tailor each component of the intervention to the needs of all sites. As the components were developed, they were pilot tested providing additional opportunity for the community to contribute to the program. In addition, all the measurement methods were pilot tested. The components were revised for Phase Two based on this feedback. Eight schools were involved in Phase One.
Slide #11

At the end of the three years of Phase One, the feasibility of implementing the full-scale study was assessed. To determine its feasibility, the study had specific aims which related to cultural sensitivity, acceptance by children, parents, school staff, and community and tribal leaders; ease and completeness of implementation; safety; applicability of the program to a variety of school types and community settings; and statistical and data management issues. The decision was made to move forward with the full-scale study.
The purpose of Phase Two is to implement and evaluate a culturally appropriate school-based intervention to prevent obesity.
In the fall/winter of 1996-1997, each site enlisted the support and cooperation of more schools, for a total of forty-one schools across all sites. Each school agreed to be randomized to one of two conditions: intervention or comparison. The comparison schools participate in all the measurement. The intervention schools, in addition to measurement activities, implement the intervention components.

The training of school staff occurs as the baseline measurements are completed and intervention is begun shortly thereafter. Timing varies slightly from site to site and school to school. Trained school staff with help from Pathways project research staff deliver all components of the intervention. The physical education and classroom curriculum are taught sequentially in third, fourth, and fifth grades starting Fall 1997 and ending Spring 2000; family involvement occurs frequently; and the food service intervention is ongoing throughout this 3-year period.

During the 3 intervention years, additional measurements on the children will be taken annually in the spring semester and at the end of the study in the final spring (2000) all the measures taken at baseline will be completed again. Study results will be reported in 2001.
In Spring 1997 (baseline), data on height, weight, two skinfolds and bioelectrical impedance (BIA) were collected from all second graders in the 41 intervention and comparison schools who had signed parental consent. These data will be used to determine percent body fat which is the primary endpoint for the study. That is, after 3 years, all these measures will be repeated. The data are entered into an equation specific to American Indian children to determine percent body fat. The expectation is that children in the intervention schools will have less body fat than those in the comparison schools after 3 years of intervention. The height and weight are taken during intervening years in the spring and will be used as a proxy to see what is happening.

Other data collected during the spring at baseline include activity level by placing motion sensors in fanny packs worn by the children. Nutrient intake is assessed by recording observations at school lunch. Nutrient content of school meals is determined from information provided by school food service staff. In Fall 1997, when the children begin third grade, baseline data collection will be completed by administration of a pencil/paper questionnaires to assess their knowledge of and attitudes toward nutrition and physical activity, as well as the type of physical activities they engage in throughout the day. Some of these assessments will be repeated in the spring of third and fourth grades, and all will be repeated at the end of the intervention, spring of fifth grade.
Slide #14B (use for intervention schools only)

Throughout the intervention, teachers and school food service staff will be interviewed or asked to keep a record of what parts of the intervention they have been able to implement. This process evaluation will be useful to the project research staff in understanding where more help is needed and in explaining the outcome of the study.
Slide #15 (Note: You may want to address Slides #16 and #17 before #15)

The Pathways intervention consists of four components: (1) classroom curriculum; (2) family involvement; (3) food service; and (4) physical activity. As noted previously, the development of these components was preceded in the feasibility phase by formative assessment.
Three elements contributed to the foundation of the intervention: (1) Social Learning Theory; (2) specific health behaviors, which may contribute to obesity, identified by the formative assessment; and (3) cultural concepts.
Several indigenous learning modes were identified and integrated into the Pathways intervention components: (1) learning through observation and practice; (2) learning from storytelling; (3) learning metaphorically; (4) holistic learning; (5) learning by trial and error; (6) learning through play; (7) learning cooperatively; and (8) learning through reflection.
Slide #18

The Pathways curriculum consists of culturally appropriate school-based lessons that promote healthful eating behaviors and increased physical activity. It was designed for children in third, fourth, and fifth grades. The curriculum for each grade is detailed in the Teacher’s Guide and is taught by the regular classroom teacher who has received training. The third and fourth grades are presented in 12 weeks, while the fifth grade is only 8 weeks; all with 2 lessons a week. Each student receives an activity book and almost weekly receives packets of activities to take home to do with adult household members.
The family component familiarizes families/households with the objectives and health behaviors central to the Pathways intervention; assists families in creating an environment which reinforces and supports healthy behaviors; and provides an interactive forum through which families and Pathways’ staff can discuss the intervention and the practical implementation of suggested behavior change. The components consist of a kick-off event, workshops, and the action and snack packs children take home weekly.
Slide #20

Lowering the fat intake of children is a target for obesity prevention and is a focus of the Pathways food service, family and curriculum, components. The majority of children at the Pathways sites eat both breakfast and lunch, or over half their weekday food, at school. This may represent over half the fat and caloric intake for students each weekday. The primary objective of the food service component is, therefore, to reduce the fat in school meals to 30% or less of calories from fat. In order to do this, the following components were established: (1) nutrient guidelines; (2) behavioral guidelines; (3) job aides (hands-on materials and activities for the food service personnel); (4) training for the school food service personnel; and (5) kitchen visits by the Pathways food service staff.
The Pathways physical activity intervention is focused on increasing energy expenditure by increasing physical activity in school. The infusion of increased activity into the school day is a logical approach with a good chance of success since it is possible to exert some direct influence over children’s activity. The overall goal of the activity intervention is to increase the total time a child spends in moderate-to-vigorous activity to at least 30 minutes per day. Other objectives are to promote positive attitudes towards regular physical activity, develop self-management skills related to self-initiated and long-term participation in physical activity, promote health-related fitness and allow for skill development to enhance success and enjoyment of activities, and ensure that activities are undertaken in a safe environment.

The Pathways physical activity intervention consists of four components: (1) Exercise breaks of short duration (2-10 minutes) to contribute to daily energy expenditure and promote positive attitude towards regular activity. At least one break is held daily for a total of at least 5 minutes. (2) A unit of modified American Indian games containing 24 traditional games. The organization of the games has been changed to provide more opportunity for activity while retaining the original nature of the games. They may be played during recess or as an exercise break. (3) A PE curriculum (SPARK PE) designed to promote high levels of physical activity regardless of skill level. It is practical and can be taught by trained classroom teachers, as well as PE specialists. In addition, (4) recess will be encouraged for at least 15 minutes three times a week.
What is the study’s value? The results of the two phases of Pathways will have important implications. It will be the first multi-site, collaborative, school-based intervention study among American Indians conducted under rigorous scientific methods. It is also one of the first childhood obesity prevention study ever conducted in the United States. Valuable information has been and will be learned which can be applied in other programs or studies to improve American Indian health. The participating Nations and universities will have contributed significantly to the advancement of science and health program planning. In addition, if the study is successful, the Pathways program will be a model of a culturally appropriate program for American Indians throughout the United States.