A groundbreaking program in Colorado is tackling the problem using an integrated science education enrichment program and child-to-parent communications.

April 9, 2003 (San Diego, CA) -- Some 20 years ago, children would hike, play basketball, and leave the house to play – only coming back when dinner was ready. Now, in many communities, open spaces have been filled with town houses and condominiums, playgrounds have been closed due to fear of possible litigation, and the increasing threats to child safety have put an end to young people exploring to their heart’s content. In the 21st century, children eat more and exercise less.

Unfortunately, the computer and television have become the best friends of too many of our children. The result is not only sociologically significant – it is also physically deadly.

The Centers for Disease Control now estimates that more than 60 percent of American adults are overweight, while almost one out of three is obese. In the last 20 years, the proportion of overweight children between ages 6 and 19 has tripled, to nearly one of every three kids. In December, 2001, Surgeon General David Satcher stated that 300,000 deaths per year are associated with overweight and obesity, and projected the annual public health cost of this condition at $117 billion, due to the life-threatening complications of diabetes, hypertension, heart disease, cancer, kidney failure and many other ailments.

A groundbreaking program in Colorado is tackling this problem head-on. An integrated science education enrichment program (Program ENERGY) has been established to reduce the rate of obesity and type 2 diabetes in elementary school students. Program Energy is funded by the National Center for Research Resources, National Institutes of Health (NCRR/NIH) Science Education Partnership Award “Shaping Health Behaviors Through Science Enrichment.” Past research has demonstrated that prevention of obesity and type 2 diabetes can be achieved by healthy eating and active living. Teaching
children to incorporate the elements of a healthy lifestyle is necessary to reduce these two preventable chronic diseases.

There are two components to this intervention/outreach effort: (1) The main enrichment program uses “Scientists in the Classroom” to lead “hands-on” challenging and fun lessons providing information about a healthy lifestyle, how the body works and science; and (2) research effort to use child to parent communication to increase parents’ physical activity and knowledge about diabetes and the three keys to prevention: maintaining a healthy weight, being physically active, and eating a healthy diet.

Program ENERGY provides inquiry-based educational enrichment in science and math using examples and exercises from food, nutrition, physical activity, biology of body weight and blood sugar regulation and seeks to teach and reinforce healthy behavioral choices. These activities are developed, coordinated and led by a team of university biomedical scientists and elementary educators. The initiative is the result of an active partnership between educators, university scientists and students that is conducted through the Dept of Food Science & Human Nutrition at Colorado State University. Partners include: Poudre School District, Culinary Arts Program of Johnson & Wales University, Denver Museum of Nature and Science, Children's Museum in Denver and Discovery Science Center in Ft. Collins. Additional partners are the American Cancer Society, 9HealthFair, Poudre Valley Health Foundation, Walk4Life, Wild Oats market, local businesses and restaurants.

First year outcomes will be presented in detail during the American Physiological Society’s (APS) annual meeting by the investigating team. The team is comprise of Francoise J. Smith, Gladys Posada-Johnson, Kelley Kiernan, Emily Minor and L. Arthur Campfield, all of the Food Science and Human Nutrition Department, College of Applied Human Sciences, Colorado State University, Fort Collins, CO. Their presentation is part of the “Experimental Biology 2003” conference, which is being co-sponsored by the American Physiological Society (APS). More than 10,000 attendees are expected to attend the conference being held in San Diego from April 11-14, 2003.

**Methodology**

A diverse team of classroom activity leaders (biomedical scientists, health professionals, farmers, chefs), joined undergraduate and graduate students to present the program to elementary school classrooms throughout the school year. During year 1, weekly classroom (60 min) and physical (30 min) activities and a 90 min after school program and occasional science museum-based events were conducted in two second and one first grade classes at Putnam Elementary School in Ft. Collins, CO. This school is approximately 50 percent Hispanic American with 70 percent eligibility for the school lunch program and has unmet educational needs in science and health. A similar school (Harris) was chosen as the control.

Each week the enrichment program provided interactive, "hands-on", fun, and challenging educational science enrichment activities. Lessons included: nutrition/science games, growing plants, sugar investigation, diversity, energy balance and healthy snacks. Classroom visits by a chef, nurse, and cultural anthropologist occurred. A field trip
allowed the active exploration of interactive exhibits at the Hall of Life in the Denver Museum of Nature and Science. Baseline and year-end assessments were obtained through measuring body mass index (BMI), waist circumference, health and science (nutrition, food and physical activity surveys) knowledge, attitudes and physical activity (by pedometer).

Second grade students enrolled at the Putnam (n=47) and Harris (35) schools. At the end of year 1, 87 percent and 97 percent of the students remained at the intervention and control schools, respectively. Students and classroom educators rated all activities. The students’ ratings ranged from 47 percent -98 percent “awesome” and 2 percent - 11 percent “did not like” for the classroom activities and from 62 percent - 82 percent “awesome” and 0 percent - 9 percent “did not like” for physical activities.

**Results**
Year 1 pre and post tests showed meaningful increases in: health and science knowledge, attitudes (e.g., increased appreciation of healthy food selection and physical activity) and behaviors (e.g., increased steps by approximately 2 miles/day, increased body acceptance). In conclusion, Program ENERGY is the result of an active community-university partnership and is increasing health and science knowledge, changing attitudes and changing health behaviors of elementary school students.

**Diabetes Knowledge and Physical Activity Increase Through Child to Parent Communication**
The purpose of this project was to increase diabetes knowledge and physical activity through child –to--parent communication, leading to prevention of Type 2 diabetes.

**Methodology**
All 14 participants involved in the study were parents of two second grade classes (7-8 years old) taking part in an obesity and diabetes prevention program: Program ENERGY. Participants completed two pre and post-intervention surveys. Surveys assessed participants’ knowledge regarding diabetes and self-reported physical activity levels. The six-week intervention used colorful, one-page, double-sided newsletters to inform participants about diabetes and how it can be prevented. They were sent home weekly with all second grade students enrolled in Program ENERGY. Students also brought home a weekly “challenge” aimed at promoting family physical activity. Each challenge included tasks to increase physical activity and diabetes knowledge. Students were rewarded points for completing the challenges with their families. These points were converted to miles to complete a virtual trek from Fort Collins, CO to Disney World, Fl.

**Results**
Intervention showed a significant increase in diabetes knowledge among the parent participants. In addition, results from the self-reported physical activity surveys showed significant increases in walking, moderate and total physical activity. Walking increased from a mean of 61 minutes per week to 114 minutes per week. Moderate physical activity increased from 92 minutes per week to 168 minutes per week. In addition, both of the second grade classes earned enough challenge points (4750 virtual miles) to complete
the virtual trek, indicating increased parental and family physical activity.

**Conclusions**
The implications of this initiative are potentially important for the prevention of type 2 diabetes and obesity in children and adults in schools and homes throughout the nation. First, this intervention provides a feasible, easily reproducible, relatively low-cost and effective method to increase diabetes knowledge and parental and family physical activity. This intervention could be replicated in any school or school district. Second, the results of this study will provide awareness that knowledge about diabetes and its prevention, and family physical activity can be increased and provide a model and encouragement to others to aggressively provide similar interventions. Third, based on the success of the child to parent communication in this study, this hypothesis and its experimental testing has been incorporated into Program ENERGY.

Overall, the study increased diabetes knowledge and physical activity. This shows that a six-week intervention based on brief newsletters and motivational challenges is effective in increasing knowledge and physical activity through child to parent communication.

-end-

The American Physiological Society (APS) is one of the world’s most prestigious organizations for physiological scientists. These researchers specialize in understanding the processes and functions underlying human health and disease. Founded in 1887 the Bethesda, MD-based Society has more than 10,000 members and publishes 3,800 articles in its 14 peer-reviewed journals each year.

***

*Editor’s Note: For receive a copy of the abstract, or to schedule an interview with a member of the research team, please contact Donna Krupa at 703.967.2751 (cell), 703.527.7357 (office) or at djkrupa1@aol.com. Or contact the APS newsroom at 619.525.6340 between 7:00 AM and 4:00 PM PST April 11-14, 2003.*