

Diabetes

Dateline

National Diabetes Information Clearinghouse

Winter 2007

New Study Seeks to Lower Diabetes Risk in Youth

Middle Schoolers in 42 Schools to Change Eating and Physical Activity Patterns

The National Institutes of Health (NIH) has launched the HEALTHY Study in middle schools around the country to determine whether changes in school food services and physical education (PE) classes, coupled with activities that encourage healthy behavior, lower risk factors for type 2 diabetes, a growing disease among American youth.

“The alarming rise in obesity and type 2 diabetes in all age groups poses a major public health crisis for this country,” said NIH Director Elias A. Zerhouni, M.D. “This important study is one component of a multifaceted research agenda to address this dual epidemic, which threatens the health of our youth and the vitality of our health care system.”

Hundreds of sixth graders from 42 participating middle schools will be randomly assigned to a program group that adopts the changes or to a comparison group that continues to offer food choices and PE programs typically seen in middle schools across the country.

Students in the program group will have

- healthier food choices from the school cafeteria and vending machines, such as lower-fat foods, more fruits and vegetables, and drinks without added sugar
- longer, more intense PE classes
- activities and awareness campaigns that promote long-term, healthy behavior



Healthier Kids

“The school environment can have a profound effect on the behavior and health of young people,” said Study Chair Gary Foster, Ph.D., of Temple University. “From this study, we hope to learn if better food options, improvements in physical activity programs, and education about eating better and moving more result in healthier kids and a lower risk of type 2 diabetes.”

In planning the HEALTHY study, researchers relied on results from six pilot studies. In one, about half of eighth graders in 12 schools were

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National Institute of
Diabetes and Digestive
and Kidney Diseases





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Gary Foster, Ph.D.
Study Chair

Researchers are conducting the HEALTHY study at the following academic institutions:

- Baylor College of Medicine, Houston
- University of California at Irvine
- University of North Carolina at Chapel Hill
- Oregon Health and Science University, Portland
- Temple University, Philadelphia
- University of Pittsburgh Medical Center
- University of Texas Health Science Center at San Antonio

George Washington University, Washington, DC, is the project coordinating center.

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overweight or at risk for becoming overweight. Although few had diabetes, about 41 percent had fasting blood glucose values that put them at increased risk for later developing type 2 diabetes.

Seventeen percent of youth between 2 and 19 years of age are overweight—triple the 1980 rate. Studies in Cincinnati, Los Angeles, San Antonio, and other cities have shown that cases of type 2 diabetes among youth have increased dramatically since 1994, when fewer than 5 percent of new childhood diabetes cases were type 2. By 1999, type 2 diabetes already accounted for 8 to 45 percent of new childhood diabetes cases, varying by geographic location.

A study in the October 2006 issue of the journal *Pediatrics* reported an estimated 1.82 cases of diabetes per 1,000 youth in 2001. Among children age 9 and younger, type 1 diabetes accounted for more than 80 percent of diabetes cases, while the proportion of type 2 diabetes among youth between 10 and 19 years of age ranged from 6 to 76 percent.

Results from the HEALTHY study are expected in 2009. The study is part of a broad research initiative called “Studies to Treat or Prevent Pediatric Type 2 Diabetes” (STOPP T2D), which seeks to improve the treatment and prevention of type 2 diabetes among youth. ■

**Diabetes
Dateline**

Diabetes Dateline, an email newsletter, is sent to subscribers four times a year by the National Diabetes Information Clearinghouse (NDIC). The newsletter features news about diabetes, special events, patient and professional meetings, and new publications available from the NDIC and other organizations.

If you would like to subscribe, send an email to niddk@info.niddk.nih.gov. You can read or download a PDF version of the newsletter at www.diabetes.niddk.nih.gov/about/newsletter.htm.



Executive Editor: Judith Fradkin, M.D.

Dr. Fradkin is the director of the Division of Diabetes, Endocrinology, and Metabolic Diseases for the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), part of the National Institutes of Health in Bethesda, MD. Dr. Fradkin earned her M.D. from the University of California at San Francisco and completed an internship and residency at Harvard’s Beth Israel Hospital in Boston. Dr. Fradkin came to the NIDDK as a clinical associate in 1979 after an endocrinology fellowship at Yale University. She has overseen NIDDK-supported research in various roles, directing the Institute’s research programs in diabetes, cystic fibrosis, endocrinology, and metabolic diseases. A practicing endocrinologist, Dr. Fradkin continues to treat patients at the National Naval Medical Center in Bethesda, where she worked as a staff endocrinologist in the early 1980s.



Studies Test New Approaches to Islet Transplantation

Researchers from six medical centers in the United States and Canada have begun testing new approaches to islet transplantation in adults with hard-to-control type 1 diabetes. The clinical studies, funded by the National Institutes of Health (NIH), will determine whether changes to current methods of islet transplantation lead to improved, long-lasting control of blood glucose with fewer side effects.

Since the Edmonton advance, scientists have been working to lengthen the survival of donor islets and reduce the side effects—such as anemia, nerve and kidney damage, and vulnerability to infection—of drugs that prevent their destruction.

In islet transplantation, clusters of insulin-producing cells, called islets, are extracted from a donor pancreas and infused into the portal vein of a recipient's liver. In a successful transplant, the islets become embedded in the liver and begin producing insulin.

Currently, islet transplantation is appropriate only for people who already had a kidney transplant or who have severe hypoglycemia. As the procedure becomes safer and new sources of beta cells are developed, more people will benefit from transplantation.

In 2000, a research team led by James Shapiro, M.D., at the University of Alberta in Edmonton, Canada, reported sustained insulin independence in seven patients transplanted with islets from two to four donor pancreases and treated with an immunosuppressive regimen that omitted glucocorticoids, which are thought to be toxic to islets.

In the following years, other researchers replicated the “Edmonton protocol” and most centers adopted this approach to islet transplantation. The protocol greatly benefits some patients with severe type 1 diabetes, but two or more infusions of islets are usually needed and the islets tend to lose their insulin-producing function over time.

Continuing Research

Since the Edmonton advance, scientists have been working to lengthen the survival of donor islets and reduce the side effects—such as anemia, nerve and kidney damage, and vulnerability to infection—of drugs that prevent their destruction. In the newly launched studies, researchers will culture islets before transplantation to enhance their viability and compare the ability of specific anti-rejection drugs to improve the engraftment of donor islets with less toxicity.

The researchers are conducting pilot studies of experimental agents, as well as pivotal, or phase 3 studies, which modify the Edmonton protocol. If the phase 3 studies succeed in safely controlling blood glucose levels, the U.S. Food and Drug Administration may approve the procedure for people with poorly controlled type 1 diabetes.

“With these modifications, we hope to see prolonged islet function with less drug toxicity,” said Study Chair Camillo Ricordi, M.D., of the University of Miami. “If these approaches are successful, type 1 diabetes patients with severe problems controlling their blood glucose may have another treatment option for controlling their diabetes.”

For more information about these studies, see www.citisletstudy.org. ■

CITR Publishes Annual Report

The Collaborative Islet Transplant Registry (CITR) has published its 2006 annual report, which analyzes information about islet transplant programs in North America between 1999 and 2005.

The number of human islet infusion procedures conducted in North America increased from 18 in 1999 to 120 in 2005. In the United States, islet transplantation is an experimental procedure regulated by the U.S. Food and Drug Administration. About 40 U.S. transplant programs either conduct islet transplantation or are in the process of starting a transplantation program.

The National Institute of Diabetes and Digestive and Kidney Diseases funds the CITR.

All CITR reports are available at www.citregistry.org.

NIH Strategic Plan Guides Type 1 Diabetes Research

The National Institutes of Health (NIH) has released a long-range plan to guide type 1 diabetes research over the next decade.

Advances and Emerging Opportunities in Type 1 Diabetes Research: A Strategic Plan outlines specific goals to make further strides in diabetes research, which has already made dramatic progress in extending life expectancy for people with type 1 diabetes.

Twenty percent of people born in the 1950s died within 20 years of a type 1 diabetes diagnosis, and 30 percent died within 25 years of diagnosis. However, only 3.5 percent of people born between 1975 and 1980 died within 20 years of diagnosis and 7 percent within 25 years.

Challenges Remain

“Research has greatly improved the length and quality of life of people with type 1 diabetes, and it has lowered the risk of developing certain serious complications, such as retinopathy and kidney failure,” said NIH Director Elias A. Zerhouni, M.D. “However, many challenges



The NIH Strategic Plan is available on the NIDDK website in two versions: one for the public and another for the scientific community.



The NIDDK at the NIH developed the Strategic Plan with oversight from the Diabetes Mellitus Interagency Coordinating Committee.

remain in combating this complex autoimmune disease. The NIH Strategic Plan sets forth a cogent, multifaceted approach to future research that soundly addresses these challenges.”

About 5 to 10 percent of the nearly 21 million people with diabetes have type 1, formerly called juvenile onset, or insulin-dependent, diabetes. Type 1 diabetes cuts about 15 years off the lives of those who have it, with early deaths due mainly to heart attacks and stroke.

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) at the NIH developed the Strategic Plan with oversight from the Diabetes Mellitus Interagency Coordinating Committee. The document, which incorporated input from patient advocacy groups and scientific experts outside the NIH, is available at www.T1Diabetes.nih.gov/plan in two versions: one for the public and another for the scientific community.

The NIH research goals for type 1 diabetes outlined in the Strategic Plan are as follows:

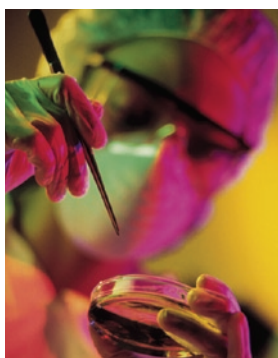
- **Identify the genetic and environmental causes of type 1 diabetes.** Researchers continue to search for genes responsible for increasing a person’s diabetes risk. Finding all the genes will boost the ability to predict who is at risk and foster prevention efforts.

STRATEGIC PLAN, continued on page 5

STRATEGIC PLAN, from page 4

Groups including the International Type 1 Diabetes Genetics Consortium and the Environmental Determinants of Diabetes in the Young are working to identify all the genetic and environmental factors responsible for diabetes.

- **Prevent or reverse type 1 diabetes.** Clinical trial groups, including the Type 1 Diabetes TrialNet and the Immune Tolerance Network, are testing ways to modulate the immune system to prevent type 1 diabetes and to arrest the autoimmune attack in people with newly diagnosed diabetes who still have some beta cells.



“The NIH Strategic Plan sets forth a cogent, multifaceted approach to future research that soundly addresses these challenges.”

Elias A. Zerhouni, M.D.
Director of the National Institutes of Health

- **Develop cell replacement therapy.** Researchers seek to overcome remaining barriers to islet transplantation by
 - finding ways to produce an unlimited supply of islets
 - improving ways to harvest islets
 - reducing complications of islet transplantation
 - testing ways to prevent recurrent autoimmunity and immune rejection of donor islets

- **Prevent or reduce hypoglycemia in type 1 diabetes.** Recently approved continuous glucose monitors developed with NIH support are helping people with diabetes better control their glucose levels. This revolutionary technology is the first step toward developing an artificial pancreas. Current studies also focus on how the brain senses hypoglycemia and on controlling hypoglycemia through behavioral therapy.
- **Prevent or reduce complications of type 1 diabetes.** NIH researchers have found that a protein called vascular endothelial growth factor spurs development of abnormal blood vessels that invade the retina and cause diabetic retinopathy, which can lead to blindness. NIH-sponsored clinical studies are testing drugs that control new blood vessel growth in eyes. The Strategic Plan also calls for studying the role of genetic factors in developing complications, applying the tools of systems biology to the understanding of complications, and using the latest advances in drug development technology to hasten potentially valuable therapies into clinical trials.
- **Attract new talent and apply new technologies to type 1 diabetes research.** The NIH is encouraging interdisciplinary collaboration, creating incentives that reward research innovation and collaboration, and attracting and training new diabetes investigators. Scientists are using imaging technologies to better understand the brain’s response to hypoglycemia and to find ways to measure a person’s number of beta cells, which could help develop promising therapies.

More information about type 1 diabetes research is available at www.ClinicalTrials.gov. ■

New NIDDK Website Makes Debut

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) unveiled a new and improved website in September, offering the National Institutes of Health staff, researchers, and the general public more online information and resources in an easier-to-use format.

The website redesign features an improved look, better navigation, and more user-friendly functions. Users who visit *www.niddk.nih.gov* will now enjoy

- new “Scientific Areas” sections that enable researchers to easily find funding areas and opportunities in their field of interest with up-to-the-minute information about
 - special NIDDK initiatives
 - upcoming conferences
 - research resources
 - NIDDK staff contacts
- easier navigation for finding information about the kinds of science the NIDDK funds and instructions necessary for completing the grant application process
- a redesigned health education section for the public with basic information on diseases, along with statistics, links to additional resources, Spanish translations, and lists of available NIDDK publications

Many website improvements also occurred behind the scenes. “The new website now has a database-driven content management system, giving us much better tools to maintain it as a truly living document,” said Maren Laughlin, Ph.D., senior adviser for integrative metabolism at the NIDDK. “The new, improved site structure should allow website visitors to more easily see all that is available to them.” Laughlin served on the NIDDK 18-member content committee, one of two committees set up to rework the website’s extramural sections.

More To Come

The recent facelift is only phase one of a three-part plan to revamp the entire NIDDK website. While the first phase focused on site architecture and updated content, phases two and three will put design and color to work to give the home page and other parts of the site a fresh look.

Final improvements include the addition of multimedia content and more database tools, such as

an automated event calendar and an organizational chart to make finding staff contact information easier. Professional and NIDDK web staff also will have new, interactive, electronic tools to help update and maintain the website.

A user survey—the American Consumer Satisfaction Index—reported an 82 percent overall satisfaction rate with the health

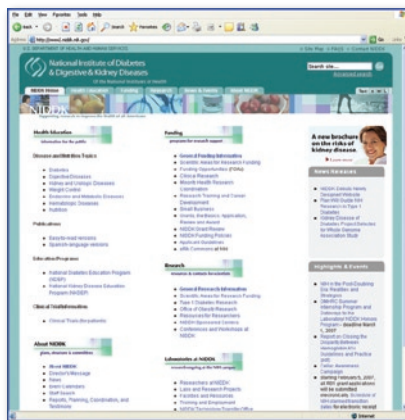
information sections of the NIDDK website for November 2005 through January 2006.

That score is among the highest achieved by all participants in the survey, which is administered jointly by ForeSee Results and the University of Michigan. The NIDDK redesigned the health information sections 3 years ago and set the standard for this effort.

“Our website is truly the public face of the NIDDK,” said NIDDK Acting Director Griffin P. Rodgers, M.D. “It facilitates the conversation that takes place among biomedical researchers at our universities and small businesses, the American public, and the Institute. With this new website, we hope to invite greater participation and better serve our mission of improved health for the American people.” ■

“Our website is truly the public face of the NIDDK.”

Griffin P. Rodgers, M.D.
Acting Director, NIDDK



NIDDK Scientist Honored by White House

Daniel Appella, Ph.D., an investigator with the laboratory of bioorganic chemistry at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), was among 56 researchers who received 2005 Presidential Early Career Awards for Scientists and Engineers (PECASE), the nation's highest honor for professionals at the outset of their independent research careers.



The PECASE awards, established in 1996, honor the most promising researchers in the nation within their fields.

Honorees, including two intramural scientists and 10 grantees, were recognized at a ceremony presided over by John H. Marburger III, science adviser to the president and director of the White House Office of Science and Technology Policy. The other intramural scientist at the National Institutes of Health (NIH) honored at the ceremony was Sohyun Ahn, Ph.D., principal investigator in the unit on developmental neurogenetics, laboratory of mammalian genes and development, National Institute of Child Health and Human Development.

Appella, a synthetic organic chemist, works at the interface of chemistry and biology. "In a nutshell, I make molecules with biological activity, and one reason NIH is a great environment is that there are lots of opportunities to test them," said Appella.

One class of these molecules binds selectively with DNA and RNA sequences. Appella is

trying to couple this with a very sensitive detection of pathogens—in particular, anthrax. He also makes molecules targeted to HIV and cancer.

"Chemistry could have a great impact on many aspects of the intramural program," Appella said. "In general, chemical approaches provide a way to start thinking about new therapies and treatments, which could help in the translational aspects of the work at NIH."

The PECASE awards, established in 1996, honor the most promising researchers in the nation within their fields. Nine Federal departments and agencies annually nominate scientists and engineers whose work shows exceptional promise. Participating agencies award these researchers up to 5 years of funding to further their investigations. ■

Upcoming Meetings, Workshops, and Conferences

American College of Physicians' Internal Medicine 2007

April 19 to 21, 2007
San Diego, CA

For more information, visit www.acponline.org/cme/as/im07.htm.

American Nephrology Nurses' Association's 38th National Symposium

April 22 to 25, 2007
Dallas, TX

For more information, visit www.annanurse.org/cgi-bin/WebObjects/ANNANurse.

U.S. Centers for Disease Control and Prevention's Division of Diabetes Translation Conference

April 30 to May 3, 2007
Atlanta, GA

For more information, visit www.cdc.gov/diabetes/conferences.

American Academy of Physician Assistants' 35th Annual Physician Assistant Conference

May 26 to 31, 2007
Philadelphia, PA

For more information, visit www.aapa.org/annual-conf. ■

The National Institute of Diabetes and Digestive and Kidney Diseases will have an exhibit booth at these upcoming conferences.



La enfermedad renal en personas con diabetes

(Kidney Disease of Diabetes)

This eight-page fact sheet explains kidney disease, its causes and treatment, and its progression to kidney failure. The publication also includes a discussion about preventing and slowing kidney disease and dialysis and transplantation. It also highlights findings of the Diabetes Control and Complications Trial as they relate to kidney disease.

Lo que usted debe saber sobre la alimentación y la diabetes

(What I need to know about Eating and Diabetes)

This easy-to-read booklet reviews diabetes nutrition basics, including what, when, and how much a person with diabetes should eat. The publication also discusses the food guide pyramid, the different food groups, and the importance of physical activity.



Consejos para muchachos con diabetes tipo 2 ¿Que es la diabetes?

(Tips for Kids: What is Diabetes?)

This colorful tip sheet from the National Diabetes Education Program outlines the basics about managing diabetes and is part of a series of reproducible, Spanish-language publications for children with diabetes and their families.



To order, please call 1-800-860-8747 or visit www.diabetes.niddk.nih.gov.

Prevention Series

The National Diabetes Information Clearinghouse has a series of booklets available in both English and Spanish to help people with diabetes prevent complications that can result from the disease. The easy-to-read patient education booklets include the following titles:

- *Prevent diabetes problems: Keep your diabetes under control*
Cómo prevenir los problemas de la diabetes: Controle la Diabetes
- *Prevent diabetes problems: Keep your eyes healthy*
Cómo prevenir los problemas de la diabetes: Mantenga los ojos sanos
- *Prevent diabetes problems: Keep your feet and skin healthy*
Cómo prevenir los problemas de la diabetes: Mantenga los pies y la piel sanos
- *Prevent diabetes problems: Keep your heart and blood vessels healthy*
Cómo prevenir los problemas de la diabetes: Mantenga sanos el corazón y los vasos sanguíneos
- *Prevent diabetes problems: Keep your kidneys healthy*
Cómo prevenir los problemas de la diabetes: Mantenga los riñones sanos
- *Prevent diabetes problems: Keep your nervous system healthy*
Cómo prevenir los problemas de la diabetes: Mantenga sano el sistema nervioso
- *Prevent diabetes problems: Keep your teeth and gums healthy*
Cómo prevenir los problemas de la diabetes: Mantenga los dientes y encías sanos

Featured in the NIDDK Reference Collection

If the Shoe Fits

This videotape program provides information about foot care for older adults with diabetes. The program describes problems such as foot insensitivity and hypersensitivity; signs of slow circulation, such as pain in the legs or feet when walking, sitting, or sleeping; cold feet; and slow-healing cuts and bruises. The video offers recommendations for preventing these and other foot problems and tips on choosing proper-fitting shoes. More information about this resource, including how to order a copy, is available at www.catalog.niddk.nih.gov/resources. ■