Twenty years ago, Philip Ozuah, M.D., Ph.D., a South Bronx pediatrician, was dealing in lumps, bumps, physical exams and vaccinations. But then he noticed something alarming: increasing numbers of children and teens with adult-onset diabetes. “We even had 8-year-olds with adult-onset diabetes,” he says. “You could see the epidemic developing before your eyes.”

The prevalence of pediatric obesity in the United States has tripled over the past three decades, and the problem is even worse in the Bronx. Today nearly half of all Bronx children are obese (with a body mass index of 30 or more) or overweight, placing them at increased risk for adult-onset diabetes, now called type 2 diabetes. This disease occurs when the body either doesn’t produce enough insulin to process sugars in the diet or can’t use the insulin it does produce. In both adults and children, obesity is the number-one predisposing cause of type 2 diabetes and also underlies the epidemic increase in prediabetic individuals; today there are some 57 million people with prediabetes in the United States alone.

Dr. Ozuah is now professor of pediatrics at Einstein and chair of pediatrics at Einstein and Montefiore Medical Center, the University Hospital and Academic Medical Center for Einstein. He uses his platform to fight the
Fighting Childhood Obesity (continued)

obesity and type 2 diabetes epidemics afflicting young people today. Most children don’t understand the dire consequences of type 2 diabetes, which include heart disease, kidney disease, blindness, lower-limb amputations and possibly insulin shots. Dr. Ozuah’s solution: a shot of physical fun.

“The more active you are, the less likely you are to be overweight,” he says. “In the Bronx, we have thousands of children in public schools for up to eight hours a day. In most of those schools, there’s no outdoor space, no gym, no physical education, so they’re sitting the whole time. Many of these children also live in neighborhoods where the family deems it unsafe to play outside.”

In 2009, Dr. Ozuah and colleagues released a 10-minute audio CD exercise program called CHAM-JAM (Children’s Hospital at Montefiore Joining Academics in Movement). Used in the classroom without the need for a trained physical education teacher, it’s a practical way to bring physical activity to resource-poor settings. “All the classroom teacher has to do is press ‘play’ on the computer or the boom box,” says Dr. Ozuah.

Best of all, it’s fun. The kids run in place, spring up like frogs or jump kangaroo-style. Some 16,000 Bronx kids have already bounced to the beat of this miniworkout. The CHAM-JAM CDs also serve up a healthy variety of food facts—for example, that scientific studies show drinking one can of soda a day increases a child’s risk of being obese by 60 percent.

CHAM-JAM is not all fun and games. It’s also part of a randomized controlled clinical study, with Dr. Ozuah as principal investigator. Preliminary findings have been encouraging. With funding from a $1.22 million National Institutes of Health grant, he and his colleagues are assessing the program’s impact on physical activity levels and fitness and expect to have results calculated by December 2011.

Q: My child is overweight. Should she have weight-loss surgery?

A: “No child under age 14 should have bariatric [weight-loss] surgery,” says Diego Camacho, M.D., assistant professor in the department of surgery at Einstein and director of the Center for Weight Reduction Surgery at Montefiore.

Gastric bypass surgery—shortening the small intestine so the body absorbs fewer calories—can be a lifesaver for a very heavy adult, but “the surgery is extremely difficult to reverse, and food is limited—no burgers, no pizza and later on no wine or beer, which is hard on young people,” he says. Parents pressuring kids to have the operation may add psychological stress.

Gastric banding—implanting a belt around the stomach to limit the amount of food that fits inside—is less extreme but also unsuitable for young children, says Dr. Camacho. While banding is reversible, “most kids under 14 can’t commit to eating right, a requirement for the surgery,” he says.
Rifkin Lecturer: Domenico Accili, M.D.

This past May, Domenico (Mimmo) Accili, M.D., professor of medicine at Columbia University, spoke at Einstein as the 2010 Harold Rifkin lecturer. Dr. Accili recently showed in mice that efforts to boost insulin activity in the liver, brain and beta cells of the pancreas can help increase insulin sensitivity (glucose control) and prevent diabetes from developing. His talk was titled “Reversing Beta Cell Failure: It Takes Guts.”

The Diabetes Research Center (DRC) sponsors the Rifkin two-day series of basic and clinical lectures each year in memory of Harold Rifkin, M.D., a clinical professor with a nearly 50-year association with Einstein and Montefiore Medical Center. Dr. Rifkin served as president of the American Diabetes Association and the International Diabetes Federation and edited the first of many editions of Diabetes Mellitus: Theory and Practice. His extraordinary intellect, charismatic teaching and advocacy for patient care and research were widely recognized.

New Faculty: Rubina A. Heptulla, M.D.

The DRC welcomes Rubina Heptulla, M.D., the new director of the division of pediatric endocrinology and an expert on type 1 diabetes in children. Among other studies, she investigates how parental math literacy affects children’s adherence to therapy and whether exenatide, a drug approved for treating type 2 diabetes, can preserve the function of pancreatic beta cells in patients with type 1 diabetes. Dr. Heptulla comes to us from Baylor College of Medicine and Texas Children’s Hospital in Houston. The next issue of the DRC newsletter will include an in-depth profile of Dr. Heptulla.

DRC Hosts Regional Meeting

This year it was the DRC’s turn to host the annual NYC Regional Diabetes Research Meeting, which promotes interactions among area researchers. In May, junior faculty from the Cornell, Mount Sinai, Columbia and Einstein colleges of medicine gathered in Robbins Auditorium to network, learn about available core service facilities and hear presentations by researchers from each institution. Einstein presenter Claire Bastie, Ph.D., discussed the discovery of a novel signaling pathway involved in calorie burning and insulin sensitivity, and Fajun Yang, Ph.D., spoke on gene expression changes that affect cardiovascular disease and type 2 diabetes.

The Argentine Connection

Coming soon: seminars at Einstein for Argentine endocrinologists and other scientists. During this two-day program, DRC faculty will update the Argentine scientists on diabetes research at Einstein. Last year, the DRC held a similar program for Brazilian colleagues.

discoveries

Clues in Jewish Genes

In recent years, scientists identified a handful of genes that may play a role in type 2 diabetes. This complex disease is triggered by an interplay among environmental factors (diet and exercise, for example) and many different genes (inherited factors). Now an international team of research scientists, including Einstein’s Nir Barzilai, M.D., professor in the departments of medicine (endocrinology) and of genetics and the Ingeborg and Ira Leon Rennert Professor of Aging Research, is piecing together the genetic interactions that drive the development of diabetes. They have discovered that Ashkenazi Jews who harbor a particular pair of genetic variants are three times more likely to develop diabetes than are individuals with neither variant. Understanding such gene combinations could help in preventing and treating type 2 diabetes in the future. The study was published in the October 2010 issue of the Journal of Clinical Endocrinology and Metabolism.

Three Diseases, One Drug

Aging can be accompanied by devastating conditions, including diabetes, coronary artery disease and Alzheimer’s disease, and scientists have been seeking molecules or mechanisms that aging-associated disorders have in common with each other. Einstein researcher Radhika H. Muzumdar, M.D., M.B.B.S., and her colleagues have discovered that a peptide (small protein) that helps nerve cells survive in the brains of Alzheimer’s patients also improves insulin sensitivity in diabetic rats, and decreases heart damage while improving heart function in mice after heart attacks. The concentration of this protective peptide declines with age, even in healthy people—a loss that could help explain why diabetes, heart attacks and neurodegeneration become more common in older adults. These findings, which may lead to new therapies for diabetes, coronary artery disease and Alzheimer’s disease, were published in the July 2009 issue of PLoS ONE and the October 2010 issue of Arteriosclerosis, Thrombosis and Vascular Biology.
The National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health has awarded Einstein a five-year, $9.5 million grant to continue its Diabetes Research and Training Center. The DRTC was also awarded a $632,000 supplemental grant, bringing the center’s total NIH support to more than $10 million. These awards will help the DRTC continue its vital role in improving prospects for preventing and treating types 1 and 2 diabetes.

As this issue goes to press, the DRC is scheduled to host “The Diabetes Epidemic: Are You at Risk?”—a panel discussion and reception—on Wednesday, January 19, 2011, at the Harmonie Club in New York City.

Jeffrey Pessin, Ph.D., the Judy R. and Alfred A. Rosenberg Endowed Professorial Chair in Diabetes Research and director of the DRC, will join Norman Fleischer, M.D., the Jacob A. and Jeanne E. Barkey Professor of Medicine, chief of the division of endocrinology and codirector of the DRC, and Meredith Hawkins, M.D., professor of medicine, division of endocrinology, and director of Einstein’s Global Diabetes Initiative, to discuss research developments at Einstein and their potential impact on diabetes management, treatment and prevention, and to answer questions about type 1 and type 2 diabetes.

The event, complimentary and open to all Einstein supporters and friends, will be held in conjunction with the DRC Visiting Committee. The visiting committee is currently being formed and will consist of supporters who wish to be more deeply involved with diabetes research at Einstein. Committee members will have opportunities to meet leading faculty members and learn about the latest research developments. For more information about the Diabetes Visiting Committee, please contact Liz Alberti at 718.430.4178 or liz.alberti@einstein.yu.edu.