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Editorial: School-Based Intervention to Reduce Obesity and Diabetes Risks: Small Steps for a Big Problem

At this point, there is not a health-care provider in America who has not seen the Centers for Disease Control and Prevention (CDC) slides showing the march of obesity across the nation (<http://www.cdc.gov/nccdphp/dnpa/obesity/trend/maps/>). Nor is it likely that any have managed to avoid a discussion of the economic, social, or personal costs of obesity and obesity-related disorders (1). Sadly, the rising disease rates associated with this epidemic no longer raise eyebrows. Instead, they have become part of the fabric of medicine and lifestyle disorders that now dominate the list of causes of morbidity and mortality. Unfortunately, children have not been immune from these effects.

There was a time when pediatricians could confidently ignore the whole gamut of obesity-related disorders, such as hypertension, dyslipidemia, and type 2 diabetes. In fact, until recently, pediatricians frequently reported their distaste for just these self-inflicted disorders as an important reason for choosing to care for children. However, depending on the age, ethnic group, and definition used, obesity prevalence among children and adolescents in the United States now ranges from 10–30% (2), and patterns of obesity and its comorbidities among children and adolescents shadow those seen in adult populations with a lag time of a decade or so. The same pattern is now recurring around the world (3). Today, sessions on obesity and insulin resistance are standing room only at pediatric conferences, as attendees try to educate themselves on topics they never learned in residency and struggle to determine what they can do to prevent and treat these disorders.

The etiology of the epidemic of obesity and related disorders is no mystery. Although investigators continue to examine the details, there is widespread consensus that expanding waistlines reflect the simple functioning of the laws of thermodynamics in an environment with too many calories ingested and too few expended (4). This imbalance is not the consequence of a single factor, but, rather, arises from many small, gradual, and synergistic changes that have been occurring progressively over the last 30 yr. As economies developed, food became progressively cheaper and more calorie dense; portion sizes expanded; eating habits changed to include more snacking, restaurant and fast-food meals; and calorie-containing beverages became part of daily intake (5). At the same time, the need to expend energy decreased as we became more likely to drive than walk, more likely to sit at a desk than use our muscles, and more likely to use the remote or wireless than get up to change the channel or answer the phone. Indeed, our society has evolved to the

point that we pay for the privilege of exercising, and calorie burning on a regular basis has become a pastime of the financially secure.

At one time, children were protected from these changes. They were more likely than adults to walk and run, to spend time outdoors, and to have their eating restricted to the home or school. In addition, schools were late to reflect the change in the society around them. They continued to provide routine physical activity in the form of gym class and recess, and lunch ladies presided over a menu that, although lacking in creativity, was immune from prepared foods and calorie-containing beverages. However, beginning in the 1980s, this too began to change. Schools, instead of being a respite from the calorically positive external environment, became a contributor to the trend, with the advent of fast food and a-la-carte items in the lunchroom, financial support of struggling school systems by beverage companies in exchange for vending contracts, and cutbacks in physical-education requirements. At the same time, opportunities for activity outside of school decreased as neighborhoods became too unsafe to allow the unsupervised play that had been the hallmark of childhood for generations, and increasing numbers of children spent the afternoon with instructions to remain indoors until a parent came home from work. Organized team participation became the dominant option, but this was expensive, and alternatives for nonathletic children dwindled. The concurrent explosion of expanded sedentary offerings, such as multichannel TV, video games, and computers, meant that children were occupied indoors and joined their parents in becoming couch nuggets in ever-increasing numbers. Finally, families began to rely more on convenience foods and restaurant meals rather than family dinner time, and caloric intake within the home increased.

Although we understand the basics of what has caused this problem, it has been harder to figure out how to reverse it. Exhorting children in the clinic to change their lifestyle while their environment stays the same is ineffective. Epstein and colleagues (6, 7), among others, have been able to promote sustained weight loss with family-based behaviorally oriented interventions among selected younger patients in a research setting, but adaptation of these approaches to a broader, less-motivated population remains of unproven efficacy. On the other hand, campaigns to change the environment such as the removal of soda from some school systems and reconfiguring neighborhoods, although necessary in the long run, are painstaking, labor intensive, and slow.

Intervening through the schools, where children spend a large part of their day, is an obvious approach (8). In this issue of the Journal, Rosenbaum *et al.* (9) in the El Camino Diabetes Prevention Project report the results of a school-based intervention in a predominately Dominican middle

Abbreviation: IVGTT, iv glucose tolerance test.

JCEM is published monthly by The Endocrine Society (<http://www.endo-society.org>), the foremost professional society serving the endocrine community.

AQ: C school in New York City. Briefly, the investigators randomly assigned two science classes to receive a 3-month intervention, while a third class acted as a control. The intervention consisted of a weekly series of didactics covering study design, scientific principles of thermodynamics and weight control, and standard diet-modification education. The participants were also invited to join an aerobic exercise session or to continue in their regular gym class 3 d/wk. All participants were assessed before and after the intervention with fasting blood draw, anthropometrics including body fat by bioimpedance, and a brief iv glucose tolerance test (IVGTT).
AQ: D The investigators demonstrated that after the intervention, body fat, body mass index, and c-reactive protein decreased,
AQ: E and insulin sensitivity increased. Of interest, there was no statistically significant difference between students who participated in the exercise sessions compared with those who participated in the classroom alone, though improvements in all measures were generally greater in the former group.

There are three aspects of this study that are worthy of attention. The first nicely demonstrates a principle of which we were already aware, whereas the second and third are novel and intriguing.

As noted above, it has been clear for some time that the changes in childhood body weight and health risks reflect the accumulated consequences of many relatively small individual aberrations in energy balance. Accordingly, in this study, a set of relatively subtle interventions that gave students the information needed to make healthier decisions translated into a measurable improvement in a number of risk factors when delivered in an environment supportive of change. Although improvements were strengthened with structured exercise, the exercise component of the intervention was not necessary because even those children who attended regular gym classes benefited. The limited additional effect of exercise class may represent the encouragement the nonparticipants received through the program to attend gym classes regularly; the general attention to exercise throughout the program, through bleeding of the lessons of aerobic exercise to those not participating; or the apparent self-selection of the most obese patients to the structured exercise. In any event, the message is that significant change can occur when children are provided the tools and direction necessary combined with limited but consistent support from teachers and mentors.

AQ: F The study also demonstrates that with care and creativity (see below), the robust outcome measures that may be necessary for appropriate interpretation of small changes can be obtained successfully in the school setting. The investigators were able to obtain a complete set of data except for the IVGTT on all 73 children and the IVGTT on 75%. The completeness of the data set and the resolution of the outcome measures allowed the investigators to demonstrate efficacy where other studies have fallen short or have focused on process measures such as change in food and beverage choices. This represents an exciting advance because the results of previous school-based interventions have been somewhat disappointing, and concern was building that such interventions may not be productive (10, 11). Instead, this study suggests that we should be careful to distinguish between failure of an intervention to promote a meaningful

change in health risk and the failure to demonstrate that change through insufficiently sensitive outcome measures.

Finally, the most intriguing aspect of the study was the didactic content provided to the participants. Although the reasons for including sessions on epidemiology, study design, and subject recruitment initially seem obscure, ultimately it becomes clear that this may have been the key to success. On reflection, the approach presents important lessons for other investigators working with this population. First, this approach helped the school to view participation in the study as supportive of its educational mission and likely helped to overcome potential bureaucratic resistance that often hampers school-based studies. Second, it promoted a stronger sense of participation in the study on the part of the subjects. They are not just being studied; they are encouraged to engage with the study design and are, in essence, invited to be subjects in their own science project. There is little doubt that this creative innovation was instrumental in encouraging the subjects to accept a greater degree of invasiveness than ordinarily reported in school-based research and promoted the impressive degree of completion. Investigators working with children and adolescents should take note. Inviting adolescents to participate in research in this manner may be more successful at promoting recruitment, adherence, and retention in research trials than traditional incentives.

In the effort to slow and reverse cultural promotion of an unhealthy lifestyle, it will be critical to enlist schools as a primary focus because there are few other locations in which an intervention can be undertaken as efficiently. Rosenbaum *et al.* (9) have demonstrated that a short and simple school-based intervention can lead to important changes in health risk in teenagers. More importantly, they have demonstrated that, with care and creativity, such an intervention can be delivered with substantial fidelity even at an inner-city school and that the intervention can be monitored with robust outcomes. Now these investigators and others must use the lessons learned to demonstrate effectiveness in larger groups of children and over longer periods of time. The ability to influence school boards and communities to embrace change will depend on demonstration of convincing and sustained effectiveness. The tools are in hand, and the children are waiting.

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References

1. Finkelstein EA, Ruhm CJ, Kosa KM 2006 Economic causes and consequences of obesity. *Annu Rev Public Health* 26:239–257

2. **Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM** 2006 Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA* 295:1549–1555
3. **Pinhas-Hamiel O, Zeitler P** 2005 The global spread of type 2 diabetes in children and adolescents. *J Pediatr* 145:693–700
4. **Hill JO** 2006 Understanding and addressing the epidemic of obesity: an energy balance perspective. *Endocr Rev* 27: 750–761
5. **Kant AK, Graubard BI** 2006 Secular trends in patterns of self-reported food consumption of adult Americans: NHANES 1971–1975 to NHANES 1999–2002. *Am J Clin Nutr* 84:1215–1226
6. **Goldfield GS, Raynor HA, Epstein LH** 2002 Treatment of pediatric obesity. In: Stunkard AJ, Wadden TA, eds. *Obesity: theory and therapy*. New York: Guilford Press; 532–555
7. **Epstein LH, Valoski A, Wing RR, McCurley J** 1990 Ten-year follow-up of behavioral family-based treatment for obese children. *JAMA* 264:2519–2523
8. **Summerbell CD, Waters E, Edmunds LD, Kelly S, Brown T, Campbell KJ** 2005 Interventions for preventing obesity in children. *Cochrane Database Syst Rev* 20:CD001871
9. **Rosenbaum M, Nonas C, Weil R, Horlick M, Fennoy I, Vargas I, Kringas P, The El Camino Diabetes Prevention Group** 2007 School-based intervention acutely improves insulin sensitivity and decreases inflammatory markers and body fatness in junior high school students. *J Clin Endocrinol Metab* 92:••••
10. **Thomas H** 2006 Obesity prevention programs for children and youth: why are their results so modest? *Health Educ Res* 21:783–795
11. **Sharma M** 2006 School-based interventions for childhood and adolescent obesity. *Obes Rev* 7:261–269

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